

Miriam Kuzbary

Department of Mathematics & Statistics
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Interests Geometric Topology, Knot Theory, Knot Concordance, Mapping Class Groups

Professional **Assistant Professor of Mathematics**
Employment Department of Mathematics & Statistics, Amherst College
 NSF Postdoctoral Fellow and Visiting Assistant Professor 2023-2024
 Department of Mathematics & Statistics, Amherst College
 NSF Postdoctoral Fellow 2021-2023
 School of Mathematics, Georgia Institute of Technology
 Visiting Assistant Professor 2019-2021
 School of Mathematics, Georgia Institute of Technology

Education **Rice University**
 Ph.D., Mathematics, 2019.
 Thesis: *Link Concordance and Groups*
 Advisor: Shelly Harvey
 M.A., Mathematics, 2014.
 University of Texas at Dallas
 B.S., Mathematics, 2012.
 Summa Cum Laude, Major Honors with Distinction, and Collegium V Honors

Publications **A study of two-periodic weft-knitted textiles using the theory of knots and links**
 Joint with Shashank Markande, Sabetta Matsumoto, and Stanley Pritchard
 In Preparation. Draft available upon request.
 Heegaard Floer homology and the word metric on the Torelli Group
 Joint with Santana Afton and Tye Lidman
 arXiv:2501.11244 [math.GT, math.GR]
 A note on string link concordance and the pure braid group
 Submitted. arXiv:2009.04641 [math.GT]
 An analogue of Milnor's invariants for knots in 3-manifolds
 Algebraic & Geometric Topology. 24.6 (2024): 3043-3067.
 A link concordance group from knots in connected sums of $S^2 \times S^1$
 Joint with Matthew Hedden
 In Preparation. Draft available upon request.

Awards and **Mathematical Sciences Postdoctoral Research Fellowship**
Fellowships National Science Foundation, 2021-
 Student Recognition of Excellence in Teaching: Class of 1934 CIOS Honor Roll
 Georgia Tech, Fall 2020, Spring 2021, and Fall 2022

Awards and Fellowships

American Dissertation Fellowship

American Association of University Women, 2018-2019

Graduate Research Fellowship

National Science Foundation, 2014-2019

Bob E. and Lore Merten Watt Fellowship

Rice University, 2012

NPSC Fellowship (declined for personal reasons)

The National Physical Sciences Consortium, 2012

Academic Excellence Scholarship

The University of Texas at Dallas, 2008

Invited Talks

Joint Mathematics Meetings, January 2025

Seattle Convention Center, Seattle, WA

Geometry Seminar, April 2024

University of Virginia, Charlottesville, VA

Topology Seminar, March 2024

Oklahoma State University, Stillwater, OK

Colloquium, February 2024

Smith College, Northampton, MA

Geometry and Topology Seminar, September 2023

University of Massachusetts, Amherst, MA

Topology of 3- and 4-dimensional manifolds Mini-Conference, July 2023

Princeton University, Princeton, NJ

MIT Geometry-Topology Seminar, April 2023

Massachusetts Institute of Technology, Cambridge, MA

Topology Seminar, April 2023

Texas State University, San Marcos, TX

Dartmouth Topology Seminar, March 2023

Dartmouth College, Hanover, NH

Geometry-Topology Seminar, November 2022

Duke University, Durham, NC

Topology Seminar, November 2022

Louisiana State University, Baton Rouge, LA

New Developments in Four Dimensions, June 2022

University of Victoria, Victoria, BC

Joint Mathematics Meetings (Online), April 2022

Online

Haverford-Bryn Mawr Bi-Co Math Colloquium, December 2021

Haverford College, Haverford, PA

AMS Sectional (Online), November 2021

University of South Alabama, Mobile, AL

Colloquium (Online), October 2021

Bard College, Annandale-On-Hudson, NY

Undergraduate Seminar, October 2021

Georgia Institute of Technology, Atlanta, GA

Nearly Carbon Neutral Geometric Topology Conference (Online), June 2021

Topology Seminar (Online), April 2021

Rice University, Houston, TX

CKVK* Seminar (Online), March 2021

The Ohio State University, Columbus, OH

Invited Talks **Topology Seminar (Online), January 2021**
University of California, Riverside, Riverside, CA

Tech Topology Conference (Online), December 2020
Georgia Institute of Technology, Atlanta, GA

Geometry, Topology, and Dynamics Seminar (Online), October 2020
Boston College, Chestnut Hill, MA

Math & Physics Undergraduate Colloquium (Online), September 2020
Andrews University, Berrien Springs, MI

Geometry-Topology Seminar (Online), April 2020
Virginia Commonwealth University, Richmond, VA

Clark Atlanta Math Society, January 2020
Clark Atlanta University, Atlanta, GA

Research Horizons Seminar, November 2019
Georgia Institute of Technology, Atlanta, GA

Topology Seminar, October 2019
University of Georgia, Athens, GA

Geometry-Topology Seminar, September 2019
Georgia Institute of Technology, Atlanta, GA

Mathworks Colloquium, July 2019
Texas State University, San Marcos, TX

AMS Sectional, March 2019
Auburn University, Auburn, AL

Virginia Topology Conference, December 2018
University of Virginia, Charlottesville, VA

Geometry/Topology Seminar, October 2018
University of California, Davis, Davis, CA

Colloquium, October 2018
Sam Houston State University, Huntsville, TX

Geometry Topology Seminar, September 2018
Georgia Institute of Technology, Atlanta, GA

Topology Virtual Seminar, April 2018
Louisiana State University, Baton Rouge, LA

Sonia Kovalevsky Day, March 2018
University of Wisconsin Eau Claire, Eau Claire, WI

Joint Mathematics Meetings, January 2018
San Diego Convention Center, San Diego, CA

Lloyd Roeling UL Lafayette Mathematics Conference, November 2017
The University of Louisiana at Lafayette, Lafayette, LA

Colloquium, September 2017
Texas Christian University, Ft. Worth, TX

Topology Seminar, September 2017
The University of Texas, Austin, TX

CMO-BIRS: Thirty Years of Floer Theory for 3-Manifolds, August 2017
Casa Matemática Oaxaca, Oaxaca City, Oaxaca, Mexico

AMS Fall Southeastern Sectional Meeting, November 2016
North Carolina State University, Raleigh, NC

Junior Hausdorff Trimester Program in Topology, October 2016
Hausdorff Research Institute for Mathematics, Bonn, Germany

Research Advising

Undergraduate Research

Stanley Pritchard, Spring 2022-Spring 2023

Interdisciplinary project with Sabetta Matsumoto (Physics)

Graham Lewis, Spring 2022

Topic: *Left Orderable Fundamental Groups*

Stanley Pritchard, Fall 2020

Milnor's Invariants of Pure 3-Braids

Erin Wilkerson (Clark Atlanta University), Fall 2020

Milnor's Invariants of Pretzel Links

Georgia Tech Online REU Summer 2020

Madison Ford (Wayne State University), Benjamin Pagano (Occidental College),

Stanley Pritchard (Georgia Tech), and Erin Wilkerson (Clark Atlanta University)

Exploring Solvability of the String Link Concordance Group Using Milnor's Invariants

Teaching

Amherst College

Instructor, MATH 211: Multivariable Calculus, Fall 2023, Spring 2025

Instructor, MATH 271: Linear Algebra, Spring 2024, Fall 2024

Instructor, MATH 279: Introduction to Knot Theory, Spring 2025

Instructor, MATH 350: Groups, Rings, and Fields, Fall 2024

Instructor, MATH 490: Special Topics: Mapping Class Groups, Fall 2024

Georgia Institute of Technology

Mentor, Independent Study on the Disk Embedding Theorem, Spring 2023

Instructor, Foundations of Mathematical Proof, Spring 2023

Instructor, Abstract Algebra I, Fall 2022

Mentor, Independent Study on Combinatorial Group Theory, Fall 2021

Mentor, Independent Study on the Alexander Polynomial and Dehn Surgery, Fall 2021

Instructor, Abstract Algebra I, Spring 2021

Instructor, Integral Calculus, Fall 2020

Instructor, Integral Calculus, Spring 2020

Instructor, Multivariable Calculus, Fall 2019

Rice University

Instructor, Linear Algebra, Summer 2018

Instructor, Multivariable Calculus, Spring 2018

Teaching Assistant, Geometric Topology, Fall 2017

Instructor, Linear Algebra, Summer 2017

Instructor, Rice Program in Mathematics for High School Students, Summer 2016

Teaching Assistant, Expanding Your Horizons in Science and Math, February 2016

Instructor, Rice Emerging Scholars Program, Summer 2015

Instructor, Calculus II, Fall 2014

Instructor, Multivariable Calculus, Summer 2014

Teaching Assistant (Head), Calculus II, Spring 2014

Teaching Assistant (Head), Multivariable Calculus, Fall 2013

Teaching Assistant, Chaos & Life Program in Mathematics for Young Women, Summer 2013

Teaching Assistant, Multivariable Calculus, Spring 2013

Teaching Assistant, Differential Equations, Fall 2012

The University of Texas at Dallas

Math Tutor, Math Lab, January 2011 - August 2012

Student Teacher, Pre-AP Pre-Calculus, METSA at R.L. Turner High School, Spring 2012

Obtained Texas Math 8-12 Teaching Certificate

Peer-Led Team Learning Leader, College Algebra, Fall 2010

Kaplan Test Prep

Class Instructor and Private Tutor, January 2009 - May 2011

Research Communities & Long Term Visits

SLMath/MSRI: SRiM Participant, Summer 2023

Berkeley, CA

ICERM Braids Visitor, Spring 2022

Providence, RI

AIM Research Community: 4-D Topology (Organizer), Spring 2021-Fall 2021

San Jose, CA

AIM Workshop: Smooth Concordance of Topologically Slice Knots Participant

San Jose, CA

Refereeing

Journal of Knot Theory and its Ramifications and Quantum Topology

Service

Conferences Organized

Links in Dimensions 3 and 4 Organizer, May 2025

ICERM Braids Reunion Conference Organizer, July 2024

AIM Research Community Organizer, 4-Dimensional Topology, Spring 2021 - Fall 2021

Tech Topology Summer School Organizer, Summer 2021 and 2023

Tech Topology Conference Organizer, Fall 2019, 2020, 2021, and 2022

Amherst College

Roster Manager Shadow MATH 271, Spring 2024

DEI Committee Shadow, Fall 2023-

Geometry and Topology Seminar Organizer (Joint w/UMass, Smith), Spring 2024-

Georgia Institute of Technology

Founding Mentor for Atlanta Undergraduate Research Mathematics Seminar

Organizer for Georgia Tech-UGA Joint Geometry-Topology Seminar, Fall 2022-Spring 2023

Research Faculty Advisory Council Math Representative, Spring 2021-Fall 2021

Trends in Low Dimensional Topology online seminar organizer, Fall 2020

RTG Geometry-Topology Seminar Organizer, Fall 2019-Spring 2023

Rice University

Organizer for HATCH Tutoring and Outreach, 2018-2019

Math Department Representative to the Graduate Student Association, 2013 - 2017

Graduate Student Reading Group Organizer, 2014 - 2017

Center for Teaching Excellence Graduate Liason, 2014 - 2015

Languages

English (native), Arabic (intermediate)