

Miriam Kuzbary

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Interests Geometric Topology, Knot Theory, Group Theory

Professional **NSF Postdoctoral Fellow 2021-**
Employment 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 **Asymptotic bounds on the d-invariant**
Joint with Santana Afton and Tye Lidman
In Preparation, expected to be on the ArXiv by January. Draft available upon request.
A study of two-periodic weft-knitted textiles using the theory of knots and links
Joint with Shashank Markande, Sabetta Matsumoto, and Sarah Pritchard
In Preparation, expected to be on the ArXiv by January. Draft available upon request.
Topological symmetry groups of algebraically trivial theta graphs
Joint with Allison Moore
In Preparation.
A link concordance group from knots in connected sums of $S^2 \times S^1$
Joint with Matthew Hedden
In Preparation.
A note on string link concordance and the pure braid group
Preprint. arXiv:2009.04641 [math.GT]
An analogue of Milnor's invariants for knots in 3-manifolds
Accepted for publication in Algebraic and Geometric Topology. arXiv:1910.12108 [math.GT]

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 and Spring 2021
American Dissertation Fellowship
American Association of University Women, 2018-2019

Graduate Research Fellowship

National Science Foundation, 2014-2019

Best Graduate Student Talk

Lloyd Roeling UL Lafayette Mathematics Conference, November 2017

Graduate Student Travel Grant

American Mathematical Society, November 2016

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

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

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

Topology Seminar, October 2019

University of Georgia, Athens, 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

Nebraska Conference for Undergraduate Women in Mathematics, January 2015

The University of Nebraska-Lincoln, Lincoln, NE

Research
Communities
& Long Term
Visits

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

Research
Advising

Senior Thesis

Sarah Pritchard, Spring 2022-

Interdisciplinary project with Sabetta Matsumoto (Physics)

Undergraduate Research

Graham Lewis, Spring 2022

Topic: *Left Orderable Fundamental Groups*

Sarah 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),

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

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

Teaching & Outreach

Georgia Institute of Technology

Mentor, Independent Study on the Disk Embedding Lemma, 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, Spring 2012
Obtained Texas Math 8-12 Teaching Certificate
Peer-Led Team Learning Leader, College Algebra, Fall 2010

Kaplan Test Prep

Teacher and Tutor, January 2009 - May 2011

Service

Georgia Institute of Technology

Founding Mentor for Atlanta Undergraduate Research Mathematics Seminar, Fall 2022-
Organizer for Georgia Tech-UGA Joint Geometry-Topology Seminar, Fall 2022
Research Faculty Advisory Council Math Representative, Spring 2021-Fall 2021
AIM Research Community Organizer, 4-Dimensional Topology, Spring 2021 - Fall 2021
Tech Topology Conference Organizer, Fall 2019, 2020, 2021, and 2022
Trends in Low Dimensional Topology online seminar organizer, Fall 2020
RTG Geometry-Topology Seminar Organizer, Fall 2019-Present

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)