Miriam Kuzbary

Curriculum Vitae

Amherst College— mkuzbary@amherst.edu — kuzbarymath.com

RESEARCH INTERESTS

Geometric Topology, Knot Theory, Knot and Link Concordance, Mapping Class Groups

PROFESSIONAL EMPLOYMENT

Assistant Professor of Mathematics, 2024–Present
Department of Mathematics, 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

Ph.D. Mathematics
Year of completion: 2019
Rice University
Thesis: *Link Concordance and Groups*
Advisor: Shelly Harvey

M.A. Mathematics
Year of completion: 2014
Rice University

B.S. Mathematics
Year of completion: 2012
University of Texas at Dallas
Summa Cum Laude, Major Honors with Distinction, and Collegium V Honors
Minor: Physics & Visual and Performing Arts
Texas 8-12 Math Teaching Certificate throught UTeach

GRANTS AND AWARDS

2022	***Student Recognition of Excellence in Teaching: Class of 1934 CIOS Honor Roll*** *Georgia Institute of Technology*
2021	***Mathematical Sciences Postdoctoral Research Fellowship*** *National Science Foundation, NSF Award Number 2103142, $150,000.00*
2021	***Student Recognition of Excellence in Teaching: Class of 1934 CIOS Honor Roll*** *Georgia Institute of Technology*
2020	***Student Recognition of Excellence in Teaching: Class of 1934 CIOS Honor Roll*** *Georgia Institute of Technology*
2018	***American Dissertation Fellowship*** *American Association of University Women, $20,000.00*
2016	***Graduate Student Travel Grant*** *American Mathematical Society*
2014	***Graduate Research Fellowship*** *National Science Foundation, $132,000.00*
2012	***Bob E. and Lore Merten Watt Fellowship*** *Rice University*
2012	***NPSC Fellowship (declined for personal reasons)*** *The National Physical Sciences Consortium, $120,000.00*

2008 ***Academic Excellence Scholarship***
The University of Texas at Dallas, full tuition and fees with stipend for books and housing.

PUBLICATIONS

Peer-Reviewed Publications

Contact manifolds, fibered knots, and Floer theory
Joint with Nancy Mae Eagles, Caifei Fan, Saliha Kıvanç, Yu Pan, Katherine Raoux, and Linh Truong
To appear in WiSCon 2026 Proceedings published by Springer.

Heegaard Floer homology and the word metric on the Torelli Group
Joint with Santana Afton and Tye Lidman
Journal of Topology 19.2 (2026): e70072

An analogue of Milnor's invariants for knots in 3-manifolds
Algebraic & Geometric Topology. 24.6 (2024): 3043-3067.

Submitted

A study of two-periodic weft-knitted textiles using the theory of knots and links
Joint with Shashank Markande, Sabetta Matsumoto, and Stanley Pritchard
Submitted. arXiv:2510.08384 [math.GT]

In Revision

A note on string link concordance and the pure braid group
In Revision. arXiv:2009.04641 [math.GT]

In Preparation

Zero Surgeries on Links
Joint with Ryan Stees

The Torelli group and Open Books on Homology Spheres
Joint with John Etnyre and Hannah Turner

A link concordance group from knots in connected sums of $S^2 \times S^1$
Joint with Matthew Hedden

INVITED TALKS & PRESENTATIONS

Conference Talks

August 2026 ***WiSCon 2026***
IPAM at University of California-Los Angeles, Los Angeles, CA

March 2026 ***AMS Southeastern Sectional Meeting***
Georgia Southern University - Armstrong Campus, Savannah, GA

January 2026 ***Lahore Topology Workshop***
Lahore University of Management Sciences, Lahore, Pakistan
This conference was funded by Matthew Gentry Durham's NSF CAREER grant. I was one of four U.S. faculty invited to LUMS to give a mini-course in this workshop introducing my area of low-dimensional topology. My mini-course consisted of five talks for an audience of faculty, students, and researchers from all over Pakistan.

November 2025 ***NEAT MAPS Conference***
Boston University, Boston, MA

February 2025 ***Redbud Topology Conference***
University of Arkansas, Fayetteville, AR

January 2025 ***Joint Mathematics Meetings***
Seattle Convention Center, Seattle, WA

July 2023 ***Topology of 3- and 4-dimensional Manifolds Mini-Conference***
Princeton University, Princeton, NJ

June 2022	***New Developments in Four Dimensions***
	University of Victoria, Victoria, BC
April 2022	***Joint Mathematics Meetings*** *(Online)*
November 2021	***AMS Sectional (Online)***
	University of South Alabama, Mobile, AL
June 2021	***Nearly Carbon Neutral Geometric Topology Conference (Online)***
December 2020	***Tech Topology Conference (Online),***
	Georgia Institute of Technology, Atlanta, GA
March 2019	***AMS Sectional***
	Auburn University, Auburn, AL
December 2018	***Virginia Topology Conference***
	University of Virginia, Charlottesville, VA
January 2018	***Joint Mathematics Meetings***
	San Diego Convention Center, San Diego, CA
November 2017	***Lloyd Roeling UL Lafayette Mathematics Conference***
	The University of Louisiana at Lafayette, Lafayette, LA
	Awarded prize for best graduate student talk
August 2017	***CMO-BIRS: Thirty Years of Floer Theory for 3-Manifolds***
	Casa Matemática Oaxaca, Oaxaca City, Oaxaca, Mexico
November 2016	***AMS Fall Southeastern Sectional Meeting***
	North Carolina State University, Raleigh, NC

Colloquia and General Audience Talks

April 2026	***Pi Mu Epsilon Mathematics Honor Society Induction Colloquium***
	College of the Holy Cross, Worcester, MA
February 2026	***Physics Colloquium***
	Amherst College, Amherst, MA
February 2024	***Colloquium***
	Smith College, Northampton, MA
August 2023	***Summer Studies Prime Time Talk***
	Hampshire College, Amherst, MA
December 2021	***Haverford-Bryn Mawr Bi-Co Math Colloquium, December 2021***
	Haverford College, Haverford, PA
October 2021	***Colloquium (Online)***
	Bard College, Annandale-On-Hudson, NY
October 2021	***Undergraduate Seminar***
	Georgia Institute of Technology, Atlanta, GA
September 2020	***Math \ Physics Undergraduate Colloquium (Online),***
	Andrews University, Berrien Springs, MI
November 2019	***Research Horizons Seminar***
	Georgia Institute of Technology, Atlanta, GA
July 2019	***Mathworks Colloquium***
	Texas State University, San Marcos, TX
October 2018	***Colloquium***
	Sam Houston State University, Huntsville, TX
March 2018	***Sonia Kovalevsky Day***
	University of Wisconsin Eau Claire, Eau Claire, WI
September 2017	***Colloquium***
	Texas Christian University, Ft. Worth, TX

Seminar Talks

March 2026	***Geometry-Topology Seminar***
	Georgia Institute of Technology, Atlanta, GA
March 2026	***Topology Seminar***
	University of Miami, Miami, FL
March 2026	***MSCS Geometry, Topology and Dynamics Seminar***
	University of Illinois Chicago, Chicago, IL
December 2025	***Topology Seminar***
	Brandeis University, Waltham, MA
November 2025	***Topology Seminar***
	University of Vermont, Burlington, VT
April 2025	***Topology Seminar***
	University of Nebraska, Lincoln, NE

March 2025	***PATCH Seminar***
	University of Pennsylvania, Philadelphia, PA
April 2024	***Geometry Seminar***
	University of Virginia, Charlottesville, VA
March 2024	***Topology Seminar***
	Oklahoma State University, Stillwater, OK
September 2023	***Geometry and Topology Seminar***
	University of Massachusetts, Amherst, MA
April 2023	***MIT Geometry-Topology Seminar***
	Massachusetts Institute of Technology, Cambridge, MA
April 2023	***Topology Seminar***
	Texas State University, San Marcos, TX
March 2023	***Dartmouth Topology Seminar***
	Dartmouth College, Hanover, NH
November 2022	***Geometry-Topology Seminar***
	Duke University, Durham, NC
November 2022	***Topology Seminar***
	Louisiana State University, Baton Rouge, LA
April 2021	***Topology Seminar (Online)***
	Rice University, Houston, TX
March 2021	***CKVK* Seminar (Online)***
	The Ohio State University, Columbus, OH
January 2021	***Topology Seminar (Online)***
	University of California, Riverside, Riverside, CA
October 2020	***Geometry, Topology, and Dynamics Seminar (Onine)***
	Boston College, Chestnut Hill, MA
May 2020	***Heegaard Floer Homology Reading Seminar (Online)***
	University of Virginia, Charlottesville, VA
April 2020	***Geometry-Topology Seminar (Online)***
	Virginia Commonwealth University, Richmond, VA
October 2019	***Topology Seminar***
	University of Georgia, Athens, GA
September 2019	***Geometry-Topology Seminar***
	Georgia Institute of Technology, Atlanta, GA
October 2018	***Geometry/Topology Seminar***
	University of California, Davis, Davis, CA
September 2018	***Geometry-Topology Seminar***
	Georgia Institute of Technology, Atlanta, GA
April 2018	***Topology Virtual Seminar (Held In Person)***
	Louisiana State University, Baton Rouge, LA
September 2017	***Topology Seminar***
	The University of Texas, Austin, TX
October 2016	***Junior Hausdorff Trimester Program in Topology***
	Hausdorff Research Institute for Mathematics, Bonn, Germany

Panels and Other Outreach

August 2026	***WiSCon 2026 Panel on Mentoring, Inclusion, and Belonging***
	IPAM at University of California-Los Angeles, Los Angeles, CA
November 2025	***STEMvember presentation on STEM research at Amherst College***
	Amherst College, Amherst, MA
October 2024	***Serving Tea Speaker at the QRC***
	Amherst College, Amherst, MA
January 2020	***Clark Atlanta Math Society chat about research opportunities at Georgia Tech***
	Clark Atlanta University, Atlanta, GA
January 2015	***Nebraska Conference for Undergraduate Women in Mathematics***
	The University of Nebraska-Lincoln, Lincoln, NE

TEACHING

Amherst College

Courses ordered by year

Fall 2026:	*MATH 111: Introduction to the Calculus*
	MATH 350: Groups, Rings, and Fields

Spring 2026:	*MATH 211: Multivariable Calculus*
	MATH 280: Graph Theory
Fall 2025:	*MATH 111: Introduction to the Calculus*
	MATH 271: Linear Algebra
Spring 2025:	*MATH 211: Multivariable Calculus*
	MATH 279: Introduction to Knot Theory
	MATH 279 is a new course I developed for Amherst College
Fall 2024:	*MATH 271: Linear Algebra*
	MATH 350: Groups, Rings, and Fields
Spring 2024:	*MATH 271: Linear Algebra*
Fall 2023:	*MATH 211: Multivariable Calculus*

Courses ordered by course

***MATH 111: Introduction to the Calculus**, Fall 2025, Fall 2026*
***MATH 211: Multivariable Calculus**, Fall 2023, Spring 2025, Spring 2026*
***MATH 271: Linear Algebra**, Spring 2024, Fall 2024, Fall 2025*
***MATH 279: Introduction to Knot Theory**, Spring 2025*
***MATH 280: Graph Theory**, Spring 2026*
***MATH 350: Groups, Rings, and Fields**, Fall 2024, Fall 2026*

Special Topics Courses

ASLC 290: Special Topics: Geometry and Islamic Architecture *(Taught jointly with Yael Rice)*
Semester: Spring 2026

MATH 490: Special Topics: Mapping Class Groups
Semester: Fall 2024

Georgia Institute of Technology

Instructor, Integral Calculus, Spring 2020, Fall 2020
Instructor, Multivariable Calculus, Fall 2019
Instructor, Foundations of Mathematical Proof, Spring 2023
Instructor, Abstract Algebra I, Spring 2021, Fall 2022
Mentor, Independent Study on the Disk Embedding Theorem, Spring 2023
Mentor, Independent Study on Combinatorial Group Theory, Fall 2021
Mentor, Independent Study on the Alexander Polynomial and Dehn Surgery, Fall 2021

Rice University

Instructor, Calculus II, Fall 2014
Instructor, Multivariable Calculus, Summer 2014, Spring 2018
Instructor, Linear Algebra, Summer 2017, Summer 2018
Instructor, Rice Program in Mathematics for High School Students, Summer 2016
Instructor, Rice Emerging Scholars Program, Summer 2015
Teaching Assistant, Geometric Topology, Fall 2017
Teaching Assistant, Expanding Your Horizons in Science and Math, February 2016
Teaching Assistant, Calculus II, Spring 2014 (Head TA)
Teaching Assistant, Multivariable Calculus, Fall 2013 (Head TA), Spring 2013
Teaching Assistant, Chaos & Life Program in Mathematics for Young Women, Summer 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

ADVISING

Amherst College Senior Theses

Lauren Kelz, Fall 2026-Spring 2027

Nathan Lee, Summer 2025-Spring 2026
Title: On the Existence of Exotic $\mathbb{R}^4$s

Undergraduate Research

Stanley Pritchard (Georgia Tech), Spring 2022-Spring 2023
Interdisciplinary project with Sabetta Matsumoto (Physics)

Graham Lewis (Georgia Tech), Spring 2022
Topic: Left Orderable Fundamental Groups

Stanley Pritchard (Georgia Tech), Fall 2020
Title: Milnor's Invariants of Pure 3-Braids

Erin Wilkerson (Clark Atlanta University), Fall 2020
Title: 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

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, 2019
San Jose, CA

SERVICE & PROFESSIONAL DEVELOPMENT

Refereeing

Quantum Topology, Journal of Knot Theory and its Ramifications, Revista Matemática Iberoamericana, Expositiones Mathematicae

Conferences Organized

Links in Dimensions 3 and 4 Organizer, ICERM, May 2025
Braids Reunion Conference Organizer, ICERM, July 2024
AMS Special Session on Topology and Geometry of 3- and 4-Manifolds, Georgia Tech, March 2023
AIM Research Community Organizer, 4-Dimensional Topology, Spring 2021 - Fall 2021
Tech Topology Summer School Organizer, Georgia Tech, Summer 2021 and 2023
Tech Topology Conference Organizer, Georgia Tech, Fall 2019, 2020, 2021, and 2022

Amherst College

Department Service

Fall 2026	*Petitions Committee Member*
	Budget Committee Member
	Geometry and Topology Seminar Organizer (Joint w/UMass, Smith, Mt. Holyoke)

Spring 2026	*Petitions Committee Member*
	Colloquium Organizer
	Committee Member for Seth Yoo's Honors Thesis
	Geometry and Topology Seminar Organizer (Joint w/UMass, Smith)
Fall 2025	*Colloquium Organizer*
	Geometry and Topology Seminar Organizer (Joint w/UMass, Smith)
Spring 2025	*Helped the students start an Association for Women in Mathematics Chapter*
	Committee Member for Karen Kang's Honors Thesis
	Geometry and Topology Seminar Organizer (Joint w/UMass, Smith)
Fall 2024	*Math meeting minutes*
	Geometry and Topology Seminar Organizer (Joint w/UMass, Smith)
Spring 2024	*Roster Manager Shadow MATH 271*
	Geometry and Topology Seminar Organizer (Joint w/UMass, Smith)

College Service and Other Activities

Fall 2026	*Faculty Computing Committee Member*
Spring 2026	*Faculty Computing Committee Member*
	AI Working Group Member
Fall 2025	*Faculty Computing Committee Member*
	AI Working Group Member
Spring 2025	*Performed in "Voicebox: Words and Music of Amherst" with Marwan Kamel*
	Organized CHI Salon "Chasing the Ghost of Authenticity: Navigating Orientalist stereotypes, diaspora identity, and the echoes of musical traditions in modern creativity" with the CHI and the Music department
Spring 2024	*Organized Performance-Lecture "Coast to Coast: Reflections from Al Andalus to Los Angeles" with Theater and Dance, and Music departments supported by funding from the Provost's office*

Professional Development

Fall 2025-	*NCFDD FSP Alumni Program (can do for free every semester and summer)*
Spring 2025	*NCFDD FSP Alumni Program*
	CTL Course Design Seminar
	Provost's Retreat on Teaching and Learning
Fall 2024	*NCFDD Faculty Success Program*
	CTL Syllabus Design Workshop

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 speaker), Arabic (heritage speaker/intermediate)