

Katherine Raoux

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Research Interests	Low-dimensional topology, Heegaard Floer theory, knot concordance, contact topology.	
Appointments	University of Arkansas , Assistant Professor, 2022 – present. Max Planck Institute for Mathematics , Postdoctoral Fellow, 2021 – 2022. Michigan State University , Postdoctoral Research Associate, 2017 – 2021.	
Other academic positions	Bryn Mawr College , Research Associate, 2019.	
Education	Brandeis University , PhD, 2017. Advisor: Daniel Ruberman. New College of Florida , BA, 2011.	
Grants and Awards	MSU Mathematics Postdoctoral Award for Excellence in Teaching , 2021. NSF-AWM Mathematics Mentoring Travel Grant , 2019. GAANN Graduate Fellowship , 2011 – 2014.	
Publications and Preprints	A 4-dimensional rational genus bound . (with M. Hedden). Submitted. ArXiv: 2308.16853. Knot Floer homology and relative adjunction inequalities . (with M. Hedden). <i>Selecta Mathematica</i> , 29 (2023). DOI:10.1007/s00029-022-00810-1. 4-dimensional aspects of tight contact 3-manifolds . (with M. Hedden). <i>Proceedings of the National Academy of Sciences</i> , 118 (2021). DOI: 10.1073/pnas.2025436118. Braids, fibered knots, and concordance questions .(with D. Hubbard, K. Kawamuro, F. C. Kose, G. Martin, O. Plamenevskaya, L. Truong and H. Turner). in <i>Research Directions in Symplectic and Contact Geometry and Topology</i> , Volume 27 of Assoc. Women Math. Ser. Springer, 2021. DOI: 10.1007/978-3-030-80979-9. τ-invariants for knots in rational homology spheres . <i>Algebraic & Geometric Topology</i> , 20 (2020). DOI: 10.2140/agt.2020.20.1601.	
Invited Conference Talks	The South Central Topology Conference III New Mexico State University, Las Cruces, New Mexico, 2023.	

Workshop: Gauge theory and its application to geometry and low-dimensional topology
University of Regensburg, Regensburg, Germany, 2023.

Mini Lectures on Tightness and 4D adjunction inequalities
SEC Geometry and Topology Workshop, Tuscaloosa, Alabama, 2023.

AMS Special Session on interactions between 3-manifolds and 4-manifolds.
AMS Fall Southeastern Sectional Meeting. Chattanooga, Tennessee, 2022.

AMS Special Session on low dimensional topology and knot theory.
AMS Fall Central Sectional Meeting. El Paso, Texas, 2022.

Interactions of gauge theory with contact and symplectic topology in dimensions 3 and 4.
Banff International Research Station, Alberta, Canada, 2022.

Session on contact and symplectic topology: Legendrian and transverse knots.
Nearly carbon neutral geometric topology conference. Virtual meeting, 2021.

AMS Special Session on topology and geometry of 3- and 4-manifolds.
AMS Spring Southeastern Sectional. Virtual Meeting, 2021.

Session on Floer theory and low-dimensional topology: Heegaard Floer homology.
Nearly carbon neutral geometric topology conference. Virtual meeting, 2020.

Special session on knots and links in low-dimensional topology.
AMS Spring Southeastern Sectional Meeting. Charlottesville, Virginia, 2020.¹

Session on topology.
Canadian Math Society Winter Meeting. Toronto, Ontario, 2019.

Low-dimensional topology and gauge theory conference.
Casa Matemática Oaxaca. Oaxaca, Mexico, 2017.

Teaching
Experience

University of Arkansas

MATH 5723: Topics in Topology – Fall 2023.
MATH 679V: Topics in Topology – Spring 2023.
MATH 2554C: Calculus 1 – Fall 2022.

Michigan State University

Math 132: Calculus I – Spring 2021.
Math 961: Algebraic Topology II – Spring 2020.
Math 310: Abstract Algebra I and Number Theory – Fall 2018.
Math 416: Metric and Topological Spaces — Fall 2018.
Math 124: Survey of Calculus I – Spring 2018.
Math 132: Calculus I – Fall 2017.

Bryn Mawr College

Math B201: Multivariable Calculus – Fall 2019.

Brandeis University.

¹Canceled due to COVID-19.

Math 10a: Calculus I – Spring 2012, Fall 2013, Fall 2014, Fall 2016.
Math 10b: Calculus II – Fall 2012, Summer 2016.

Mentoring
Activities

MSU SURIEM REU, Summer 2018.

Mentored undergraduate project on knots resulting in the following article:
Bell, Tolson H.; Luo, David C.; Seaton, Luke; and Serra, Samuel P. (2020) "[Gordian Adjacency for Positive Braid Knots](#)," Rose-Hulman Undergraduate Mathematics Journal: Vol. 21 : Iss. 2 , Article 5.

MSU Exchange Research Program, Fall 2017.

Co-mentored, with K. Hendricks, undergraduate project on knot Floer theory.

Teaching Mentor, MSU – Spring 2018, Fall 2017; Brandeis University – Spring 2012.

Selected by my department to mentor graduate students learning to teach.

Service

Fall 2023 Redbud Topology Conference Organizer, October, 2023.

UArk Undergraduate Advisor, August 2023 – present.

UArk Graduate Committee, May 2023 – present.

UArk Library Liason, August 2022 – present.

UArk AWM Student Chapter Faculty Co-sponsor, November 2022 – present.

AMS Spring Central Sectional Meeting, April 2020.²

Organizer for Special session on low-dimensional topology.

Lecture for MSU AWM Student Chapter, March 2020.

Gave a virtual lecture for the MSU AWM Student Chapter.

MSU Inclusion in Math and Advising Learning Community, May 2018.

Invited participant to a workshop on inclusion and bias in the classroom.

PROMYS Math Circle, Spring 2017.

Organized and ran a PROMYS Math Circle at Boston Latin Academy; wrote materials for the program for future use.

Science Posse Program, 2013 – 2016.

Led workshops about knots for students accepted to the Brandeis Science Posse.

Brandeis Women in Science Initiative, 2014 – 2015.

Helped plan and organize events; established a website: <http://brandeis.edu/wisi>.

Recent seminar
talks and
contributed
lectures

Tech Topology Conference, Lightning talk, 2023.

Redbud Topology Conference, 2022.

University of Arkansas Topology Seminar, 2022.

Max Planck Institute for Mathematics Low-dimensional Topology Seminar, 2022.

University of Nevada Reno Topology Seminar, 2021.

²Canceled due to COVID-19.

University of Pennsylvania Geometry and Topology Seminar, 2021.
University of Michigan Topology Seminar, 2021.
Boston College Geometry, Topology and Dynamics Seminar, 2021.
Caltech Geometry and Topology Seminar, 2021.
Trends in Low-dimensional Topology, 2020.
Bryn Mawr College PACT Seminar, 2019.
Princeton University Topology Seminar, 2019.
Indiana University Topology Seminar, 2018.
McMaster University Geometry and Topology Seminar, 2017, 2019.
Mathematics of Gauge Fields Seminar, Simons Center for Geometry and Physics, 2017.
Boston Graduate Topology Seminar, Massachusetts Institute of Technology, 2016.
Wesleyan University Topology Seminar, 2016.
Claremont College Topology Seminar, 2016.
University of Virginia Geometry Seminar, 2016.