

# Katherine Raoux

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CONTACT INFORMATION	Max Planck Institute for Mathematics Vivatsgasse 7 53111 Bonn, Germany	<i>Email:</i> <a href="mailto:raoux@mpim-bonn.mpg.de">raoux@mpim-bonn.mpg.de</a> <i>Web:</i> <a href="https://guests.mpim-bonn.mpg.de/raoux">guests.mpim-bonn.mpg.de/raoux</a>
RESEARCH INTERESTS	Low-dimensional topology, Heegaard Floer theory, knot concordance, contact topology.	
APPOINTMENTS	<b>Max Planck Institute for Mathematics</b> , Postdoctoral Fellow, 2021 – present. <b>Michigan State University</b> , Postdoctoral Research Associate, 2017 – 2021. <b>Bryn Mawr College</b> , Research Associate, 2019.	
EDUCATION	<b>Brandeis University</b> , PhD, 2017. Advisor: Daniel Ruberman. <b>New College of Florida</b> , BA, 2011.	
PUBLICATIONS AND PREPRINTS	<a href="#">Knot Floer homology and relative adjunction inequalities.</a> (with M. Hedden). Submitted. arXiv:2009.05462.  <a href="#">4-dimensional aspects of tight contact 3-manifolds.</a> (with M. Hedden). <i>Proceedings of the National Academy of Science</i> , 118(22), 2021. DOI: 10.1073/pnas.2025436118.  <a href="#">Braids, Fibered Knots and Concordance questions.</a> (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.  <a href="#"><math>\tau</math>-invariants for knots in rational homology spheres.</a> <i>Algebraic &amp; Geometric Topology</i> <b>20</b> (2020) 1601–1640. DOI: 10.2140/agt.2020.20.1601.	
GRANTS	<b>NSF-AWM Mathematics Mentoring Travel Grant</b> , 2019.	
AWARDS	<b>MSU Mathematics Postdoctoral Award for Excellence in Teaching</b> , 2021. <a href="#">GAANN Graduate Fellowship</a> , 2011 – 2014.	
INVITED CONFERENCE TALKS	<a href="#">Low dimensional contact and symplectic topology: Legendrian and transverse knots.</a> Nearly carbon neutral geometric topology conference. Virtual Meeting, June 2021.  <a href="#">Floer Theory and low-dimensional topology: Heegaard Floer homology.</a> Nearly carbon neutral geometric topology conference. Virtual Meeting, June 2020.	

INVITED  
CONFERENCE  
TALKS (CONT.)

*Special Session on Knots and Links in Low-Dimensional Topology.*  
AMS Spring Southeastern Sectional Meeting. Charlottesville, Virginia, March 2020.<sup>1</sup>

*Session on Topology.*  
Canadian Math Society Winter Meeting. Toronto, Ontario, December, 2019.

*Low Dimensional Topology and Gauge Theory Conference.*  
Casa Matemática Oaxaca. Oaxaca, Mexico, 2017.

TEACHING  
EXPERIENCE

**Michigan State University – Instructor.**

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 – Instructor.**

Math B201: Multivariable Calculus – Fall 2019.

**Brandeis University – Instructor.**

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

**Brandeis University – Teaching Assistant.**

Linear Algebra, Advanced Calculus, Intro to Combinatorics, Algebraic Topology.

MENTORING  
ACTIVITIES

**MSU SURIEM REU**, Summer 2018.

Led 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-led, with Kristen 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

**AMS Spring Central Sectional Meeting**, April 2020.<sup>2</sup>

Organizer for Special Session on Low-dimensional Topology.

**Lecture for MSU-AWM Student Chapter**, March 2020.

Gave a virtual lecture for students in the MSU’s AWM Chapter.

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

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

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<sup>1</sup>Canceled due to COVID-19.

<sup>2</sup>Canceled due to COVID-19.

SERVICE (CONT.)	<p><b>PROMYS Math Circle</b>, Spring 2017. Organized and ran a PROMYS Math Circle at Boston Latin Academy meeting weekly with students. Wrote materials the program will use in the future. One of my students earned a scholarship and attended PROMYS in 2017.</p> <p><b>Posse Program</b>, 2013 – 2016. Led workshop about knots for students accepted to the Brandeis Posse program.</p> <p><b>Brandeis Women in Science Initiative</b>, 2014 – 2015. Helped plan and organize events; established a website: <a href="http://brandeis.edu/wisi">http://brandeis.edu/wisi</a>.</p>
RECENT SEMINAR TALKS	<p>University of Nevada Reno Topology Seminar, 2021. 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. NC State Geometry and Topology Seminar, 2018. 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, MIT, 2016. Wesleyan University Topology Seminar, 2016. Claremont College Topology Seminar, 2016. University of Virginia Geometry Seminar, 2016.</p>
REFERENCES	Available upon request.