

## Abhishek Mallick

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CONTACT INFORMATION	<p>Rutgers University, New Brunswick</p> <p>Hill Center, Busch Campus, 110 Frelinghuysen Road Piscataway, NJ 08854, USA.</p> <p>Email: <a href="mailto:abhishek.mallick@rutgers.edu">abhishek.mallick@rutgers.edu</a></p>
RESEARCH INTERESTS	<p>Low dimensional topology. Heegaard Floer homology. Seiberg-Witten Theory. Instanton Floer Homology. Khovanov homology.</p>
EMPLOYMENT	<p><b>Rutgers University, New Brunswick</b></p> <p>Hill Assistant Professor, 2023 Spring-2025 Summer.</p> <p><b>Mathematical Sciences Research Institute (SLMath), Berkeley</b></p> <p>Postdoctoral Fellow Fall, 2022</p> <p><b>Max-Planck-Institut für Mathematik, Bonn</b></p> <p>Postdoctoral Research Fellow 2021-22</p>
EDUCATION	<p><b>Michigan State University</b></p> <p>Ph.D. Mathematics 2021</p> <ul style="list-style-type: none"><li>• Advisor: Matthew Hedden</li></ul> <p><b>Ramakrishna Mission Vivekananda Educational and Research Institute, India</b></p> <p>M.Sc. in Mathematics, 2015, B.Sc in Mathematics 2013.</p>
PUBLICATIONS	<p><b>Corks, involutions, and Heegaard Floer Homology</b>, <i>Journal of the European Mathematical Society</i>, 25(6) (2023), 2319-2389. (with Dai and Hedden).</p> <p><b>Equivariant knots and knot Floer homology</b>. <i>Journal of Topology</i>, 16(3), (2023), 1167-1236 (with Dai and Stoffregen).</p> <p><b>Knot Floer homology and surgery on equivariant knots</b>, to appear in the <i>Journal of Topology</i>.</p> <p><b>The (2,1)-cable of the figure-eight knot is not smoothly slice</b>, to appear in the <i>Inventiones Mathematicae</i> (with Dai, Kang, Park, and Stoffregen).</p> <p><b>Rank-expanding satellites, Whitehead doubles, and Heegaard Floer homology</b>, (with Dai, Hedden, and Stoffregen), to appear in the <i>Journal of Topology</i>.</p> <p><b>From diffeomorphisms to exotic phenomena in small 4-manifolds</b>, arXiv: 2304.05997 (with Konno, and Taniguchi).</p> <p><b>Exotic Dehn twists on 4-manifolds</b>, arXiv: 2306.08607 (with Konno, and Taniguchi).</p> <p><b>Involutions and the Chern–Simons filtration in instanton Floer homology</b>, arXiv: 2309.02309 (with Alfieri, Dai, and Taniguchi).</p>

**Gompf's cork and Heegaard Floer homology**, *International Mathematical Research Notices*, 2024, 18, 12663-12682 (with Dai and Zemke).

**On localizing groups of exotic diffeomorphisms of 4-manifolds**, arXiv: 2406.11773 (with Konno).

**A note on cables and the involutive concordance invariants**, arXiv: 2409.02192 (with Hendricks).

**Exotically knotted closed surfaces from Donaldson's diagonalization for families**, arXiv: 2409.07287 (with Konno, and Taniguchi).

## TEACHING

Fall	2024	Primary Instructor, two sections of Calculus I-(Differentiation and Integration)
Spring	2024	Primary Instructor, <i>Floer Homology and Low-Dimensional Topology</i> , Graduate Topics Course Topology
Fall	2023	Primary Instructor, two sections of Calculus I-(Differentiation and Integration)
Spring	2023	Primary Instructor, two sections of Calculus I-(Differentiation and Integration)
Spring	2020	Teaching Assistant, Calculus III (Multivariable Calculus)
Fall	2019	Teaching Assistant, Calculus III (Multivariable Calculus)
Summer	2019	Primary Instructor, College Algebra
Spring	2019	Teaching Assistant, Graduate course on Algebraic Topology
Fall	2018	Teaching Assistant, Calculus III (Multivariable Calculus)
Spring	2018	Teaching Assistant, Calculus III (Multivariable Calculus)
Fall	2017	Teaching Assistant, Transition to Proofs
Summer	2017	Primary Instructor, Calculus IV (Differential Equation)
Spring	2017	Primary Instructor, Calculus IV (Differential Equation)
Fall	2016	Primary Instructor, Calculus II (Integration, Series, Sequence)
Summer	2016	Primary Instructor, Calculus II (Integration, Series, Sequence)

## INVITED TALKS

*Rutgers Undergraduate Mathematical Association Seminar, 2024*

*Gauge Theory Virtual Seminar, 2024*

*Stanford University, Topology seminar, 2024*

*University of Texas at Austin, visit, 2024*

*Link invariants and surfaces in 4-manifolds, AMS special session, University of Texas, San Antonio, 2024*

*Braids Reunion Workshop, ICERM, Brown University, 2024*

*Institute of Mathematics of the Polish Academy of Sciences, Simons Semester-Knots,*

*Homologies and Physics, 2024*

*University of British Columbia, Topology seminar, 2024 (unable to travel)*

*MIT, Geometry and Topology seminar, 2024*

*Gauge theory learning seminar, Rutgers University, 2024*

*UCLA, 2024 Geometry and Topology Workshop UCLA, 2024*

*Stony Brook University, Symplectic Geometry, Gauge Theory and Low-Dimensional Topology seminar, 2023*

*Columbia University, Geometric Topology seminar, 2023*

*University of Virginia, New Developments in 3- and 4-Manifold Topology, 2023.*

*University of Georgia, Geometry and Topology seminar, 2023.*

*Log Cabin Conference on Concordance and Knotted Surfaces, Arizona, 2023.*

*Rutgers University - New Brunswick, Geometry and Topology seminar, 2023.*

*Oberwolfach Workshop: Morphism in Low-dimensional topology, 2023 (unable to attend)*

*MIT, Geometry and Topology seminar, 2022.*

*Stanford University, Topology seminar, 2022.*

*MSRI, Berkeley, Floer homotopy theory program seminar, 2022.*

*Princeton University, Topology seminar, 2022.*

*IBS Center for Geometry and Physics, CGP seminar, 2022.*

*Max Planck Institute for Mathematics, Surfaces in 4-manifolds, 2022.*

*American Institute of Mathematics, Program on 4-manifolds, virtual, 2021.*

*American Mathematical Society, special session on the Topology and Geometry of 3- and 4-manifolds, at the AMS Southeastern Sectional Meeting, virtually at Georgia Tech 2021.*

*Joint Mathematics Meetings: AMS Special Session on Low Dimensional Topology, (Associated with AMS Invited Maryam Mirzakhani Lecture), virtual conference, 2021.*

*Nearly Carbon Neutral Geometry Topology Conference, mini-session on 4-manifolds, virtual conference, 2020.*

*American Mathematical Society, Sectional Meeting; Special Session on Low-dimensional Topology, Purdue University (canceled), 2020.*

*University of Virginia, Geometry Seminar, 2020.*

*Graduate Student Topology and Geometry Conference*, Indiana University Bloomington (postponed), 2020.

HONORS AND AWARDS	2010–2015	Jagadis Bose National Science Talent Search Scholarship.
	2010–2015	Innovation in Science Pursuit for Inspired Research Fellowship, Department of Science and Technology, Govt.of India.
	2016	Paul and Wilma Dressel Endowed Scholarship, MSU.
	2016	College of Natural Science Dissertation Continuing Fellowship, MSU.
	2018	Paul and Wilma Dressel Endowed Scholarship, MSU.
	2020	Douglas A. Spragg Endowed Fellowship in Mathematics, MSU.
	2020	College of Natural Science Dissertation completion Fellowship, MSU.
UNDERGRADUATE STUDENT SUPERVISION	Jay Patwardhan - Rutgers University (REU), Zheheng Xiao - Columbia University (REU).	
GRADUATE STUDENT SUPERVISION	Informal reading course on Heegaard Floer homology - Timothy Bates (Rutgers).	
PROFESSIONAL SERVICE	Mentor for an REU project (Rutgers University, Summer 2023) on the topic <i>Generalized Mazur pattern and Bordered Heegaard Floer homology</i> .	
	Referee for <i>Advances in Mathematics</i> , <i>Algebraic &amp; Geometric Topology</i> , <i>Compositio Mathematica</i> , <i>Geometry &amp; Topology</i> , <i>Journal of Topology</i> , <i>K3 problem list</i> , <i>Selecta Mathematica</i> .	
ORGANIZATION	<i>Co-organizing a Special Session in Joint Mathematics Meetings (JMM), 2025- ‘Concordance and Cobordism in Low-dimensions’ with Maggie Miller and Ryan Stees</i>	
	<i>Co-organizing Rutgers Geometry and Topology weekly seminar, 2024</i>	
	<i>Co-organized Rutgers Gauge Theory, Low-Dimensional Topology, and Geometric Analysis Conference, 2024</i>	
	<i>Co-organized Rutgers DIMACS REU, Summer 2023</i>	
	<i>Co-organized Postdoctoral Research Seminar on Floer homotopy theory, MSRI-SLMath, 2022</i>	
	<i>Co organized a mini-session in Nearly Carbon Neutral Geometry Topology Conference, virtual conference, 2021.</i>	
	<i>Co-organized weekly student Geometry and Topology seminar, MSU, 2017-2018.</i>	
	<i>Co-organized Graduate Student Topology and Geometry Conference, MSU, 2017.</i>	

## OUTREACH

Acted as a mentor for a non-profit organization, *Padakshep*, based in India, which supports underprivileged meritorious school students with academic guidance.