

# Amey Abhay Joshi

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**Education**

**Michigan State University:** PhD in mathematics (ongoing)  
College of Natural Sciences  
**Michigan State University:** Masters in Mathematics Dec'25  
College of Natural Sciences  
**IISER Pune:** Master of Science May '22  
**IISER Pune:** Bachelor of Science May '22

**Vivekanand College, Kolhapur:** 11th and 12th standard July '15-June '17

**S.M.Lohia high school, kolhapur:** 5th-10th standard June '09-April '15  
10 th standard SSC exam percentage :96/100

**Employment**

MSU-Teaching Excluded Assistant II Aug22-May23  
MSU-Teaching Assistant MTH234 Summer 23, Fall 23  
MSU Summer Topology Program Mentor Summer 23  
MSU-Teaching Assistant MTH 314- Matrix Algebra with Applications Spring 24  
MSU-instructor of record - MTH314 Summer 24  
Mathematics Instructor- [Louis Stokes Alliance for Minority Participation \(LSAMP\)](#)  
Summer 24  
Grader - MTH327H Fall 24  
TA MTH314 Spring 25  
Lead TA MTH124 Spring 25  
Lead TA- for first year grad students Summer 25  
iSTEM Math instructor Summer 25  
Graduate Real Analysis TA Fall 25  
Lead TA - MTH 124 Survey of calculus Fall 25

**Research Interests** Khovanov Homology, Heegard-Floer, Symplectic Topology, Four manifold Theory.

**Publications** [Abelian branched covers of rational surfaces](#)  
with Robert Harris, Doug Park, Mainak Poddar  
**In Preparation:** Spectral Sequences in Lasagna theory

## Research projects

- Khovanov Homology and quantum error-correction [with Zaike Group](#)
- Inverse problems in Machine Learning Prof. Mark Iwen
- Skein Lasagna Modules and Spectral Sequences Prof. Matthew Stoffregen
- Kirby color for TQFTs and knot theory based invariants Prof. Matthew Hedden, Prof. Matthew Stoffregen
- Sheaf Theoretic applications of Atiyah Floer Conjectures Prof. Matthew Hedden

## Advisor

- Four Manifolds and Gauge Theory MS Thesis project Doug Park
- Symplectic Classes of representations Steven Spallone

### organizational and Volunteer experience

- Co-organizer : Graduate Student Topology and Geometry Conference 2024
- Mathematics Mentor - Loius Stokes Alliance for Minority Participation Summer 2024
- Organizer- Kirby Color and Skein Lasagna Modules Seminar Fall 2024
- Volunteer- Math night for Elementary School Fall 2024
- Instructor and Project Guide: Computational applications of matrix algebras- Student Projects Summer 2024
- Organizer- Deeper structures in Lasagna Modules of TQFTs Spring 25

### Reading Projects

### Advisor

- Kirby color for Khovonov Homology Matthew Stoffregen, Matthew Hedden
- Floer Homology Matthew Stoffregen, Matthew Hedden
- Four Manifolds and Gauge Theory Prof. Doug Park
- h-cobordism theorem semester project SPRING 2021, Prof. Mainak Poddar
- Characteristic Classes and Milnor's exotic sphere Summer 2020 Prof. Mainak Poddar
- Lie Groupoids and Orbifolds as a part of VSRP 2020 Prof.S.K.Roushon
- Schemes, Complex Manifolds and non-algebraic manifold mini project of Algebraic Geometry course SPRING 2021 Dr. Vivek Mallick

### Conferences and Workshops-

- [Workshop- Scottish Talbot on Algebra and Topology](#)
- Links in 3 and 4 dimensional Manifolds, ICERM, May 2025
- International Georgia Topology Conference, Athens, May 2025
- New structures in low dimensional topology, Budapest 2024 (online participation due to technical travel issues)
- 41st Workshop in Geometric Topology 2024
- [Trisectors Workshop](#) 2023
- Introductory Workshop: Floer Homotopy Theory Sep'22
- "Geometric Topology" conference Dec-2019.
- [IISc-IISER math symposium](#) Sep-2021.
- [Unifying Themes in Geometry](#) Sep 2021.

## Talks

- Diagramatic non-vanishing result - STOAT'26
- Inverse problems in Electro Magnetic Theories - April' 25
- Abelian Branched Covers of Rational Surfaces- 41st Geometric Topology workshop
- "Khovonov Homology returns" (How to get manifold invariants from knot invariants) at MSU student topology seminar Fall'24
- organizer and main presenter - "kirby color for Khovonov Homology" seminar Fall'24
- Symplectic Geography Problem - MSU student topology seminar Fall'23
- Lagrangian Floer Homology - Fall'23
- Morse-Bott Theory- Fall'23
- Kirby Color in Khovonov Homology - Series of weekly talks Fall'24

## Awards and Honors

- TA Award for Excellence in Teaching by MSU math department Spring'26
- Douglas A. Spragg Endowed Fellowship Award Spring'26
- Graduate Research Associate Fellowship Spring'26
- Infosys foundation scholarship 2021-22
- TIFR Visiting Student Research Program fellow Summer 2020
- IISER Mohali Summer Research fellow Summer 2019
- National Graduate Physics Exam 2018-19: national top 1 percent
- DST-INSPIRE SHE fellow since 2017
- IIT-JEE Advanced 2017 All India Rank-5056 (equivalent to 99 percentile)

## References (Industrial Research)

- [Bamborde' Balde'](#) , Founder:[Zaiku Group](#)
- Prof. Mark Iwen, Department of Mathematics

## References (Research)

- [Prof. Matthew Hedden](#), Department of Mathematics, MSU
- [Dr. Matthew Stroppfregen](#), Department of Mathematics, MSU
- [Prof.Doug Park](#), Department of Mathematics, University of Waterloo, Ontario, Canada.  
email : [bdpark\(AT\)uwaterloo.ca](mailto:bdpark@uwaterloo.ca)
- [Prof.Mainak Poddar](#), Chair, Department of Mathematics, IISER Pune.  
email : [mainak\(AT\)iiserpune.ac.in](mailto:mainak@iiserpune.ac.in)
- [Dr.Steven Spallone](#), Associate professor, Department of Mathematics IISER Pune.  
email : [sspallone\(AT\)iiserpune.ac.in](mailto:sspallone@iiserpune.ac.in)

## References (Teaching)

- [Tsvetanka Sendova](#), Department of mathematics, MSU.
- [Jamillah C Gross-Caldwell](#), specialist and LSAMP coordinator, MSU

## Software

- Python
- SageMath
- L<sup>A</sup>T<sub>E</sub>X
- MATLAB
- HTML

## Languages

- English : Fluent
- Hindi : Fluent
- Marathi: Mother Tongue
- Sanskrit: High school elective