Aakash Parikh

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Research interests: Low dimensional topology and equivariant versions of Floer homological invariants.

Education

Rutgers University **09/2019 – Present**
Ph.D in Mathematics, supervised by Dr. Kristen Hendricks *New Brunswick, NJ*

University of Cambridge **10/2018 – 06/2019**
MASt (Master in Advanced Study) - Part III of the Mathematical Tripos *Cambridge, England*

University of Pennsylvania **09/2015 – 06/2018**
BA in Mathematics *Philadelphia, PA*

Research Experiences

Localization Spectral Sequences for Strongly Invertible Knots **Ongoing**
Dissertation project *New Brunswick, NJ*

- I am using a localization result due to Seidel and Smith in symplectic geometry to deduce the existence of two spectral sequences associated to any strongly invertible knot $K \subset S^3$. The first starts at the singular link Floer homology of $L_b(K)$ (the so-called butterfly link of K) and converges to the knot Floer homology of the quotient knot of K. The second starts at the knot Floer homology of K and converges to the the Heegaard Floer homology of S^3 (which is trivial). I am trying to extract rank inequalities for knot Floer homology out of the first sequence, and trying to define an equivariant concordance invariant (namely, the grading that survives to the E^∞ page) from the second.

Inverse Problems in Differential Galois theory **Summer 2018**
Supervised by Julia Hartmann *Philadelphia, PA*

- This project was an application of the patching techniques developed by Julia Hartmann and Daniel Krashen to provide a new solution of the inverse differential Galois problem over $\mathbb{C}(X)$ (Q:Does every linear algebraic group arise as the differential Galois group of some Picard-Vessiot extension? A: Yes.)

Electronics for ATLAS detector **Summer 2016**
Lab assistant *Philadelphia, PA*

- We tested newly developed components for an upcoming detector upgrade. I developed C++ skills and hands-on electronics experience.

Work/Teaching Experience

Rutgers Math Department TA **Fall 2020-Present**
TA for calculus I, II and III in online, hybrid and in person settings *New Brunswick, NJ*

Rutgers Math Department grader **Fall 2019, Spring 2020**
Grader for mathematical quantum mechanics, and intro to proofs *New Brunswick, NJ*

Ross Mathematics Program counselor **Summer 2017**
Student and junior counselor in summers 2015/16 *Columbus, OH*

Other

Rutgers Graduate Student Geometry and Topology seminar **Spring 2022-Present**
Spring 2023 co-organizer. Two talks contributed (spectral sequences/handle calculus) *New Brunswick, NJ*

MSRI Floer Homotopy Theory summer school participant **July 2022**
Learned about recent developments in Floer theory and algebraic topology *Vancouver, Canada*

Geometry/topology conferences attended **2022**
GSTGC @ Georgia Tech and Cornell Topology Festival *USA*

Technical skills

Languages: Python, Java, C++, MATLAB, LaTeX