

Shruthi Sridhar

Mathematics CV

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Education

- 2018-current **Ph.D. Mathematics (expected 2023)**, *Princeton University*, Advisor: Prof. David Gabai.
- 2019 **M.A Mathematics**, *Princeton University*, Passed general examination.
- 2014 - 2018 **B.A. Mathematics**, *Cornell University*, summa cum laude.
- 2002 - 2014 P. S. Senior Secondary School, Chennai, India

Research Experience

- Summer 2017 **University of Minnesota - Twin Cities, REU, Undergraduate Researcher.**
Worked on classifying ribbons with the same Schur support with other undergraduates under the supervision of Prof. Pavlo Pylyavskyy. (See Papers and Reports)
Worked on the cyclic sieving phenomenon for cyclic codes with another undergraduate under the supervision of Prof. Victor Reiner (See Papers and Reports).
- Summer 2016 **SMALL REU, Williams College, Undergraduate researcher.**
Worked on cusp densities of hyperbolic knots with other undergraduates under the supervision of Prof. Colin Adams. (See Papers and Reports)
- Summer 2015 **Cornell SPUR program, Undergraduate Researcher.**
Studied the bijections between Jacobians of regular matroids and spanning trees with another undergraduate under the supervision of Prof. Farbod Shokrieh
- Spring 2015 **Independent Study, Cornell University.**
Worked on a conjecture by Baker and Wang on torsor structures on spanning trees of ribbon graphs under the supervision of Prof. Farbod Shokrieh

Awards

- 2019 **Outstanding Poster Award**, *Joint Math Meetings.*
- 2018 **Kieval Prize**, *Cornell University.*
- 2018 **Phi Beta Kappa**, *Cornell University.*
- 2018 **Alice T Schafer Prize**, *Honorable Mention.*
- 2017, 2015 **William Lowell Putnam Exam**, *Top 200.*
- Aug 2016 **Outstanding Presentation Award**, *MAA MathFest.*
- 2014 - 2018 **Tata Scholarship**, *Cornell University.*
- Aug 2014 **International Olympiad for Astronomy and Astrophysics**, *Suceava, Romania*, Silver Medal.

Employment

- Fall 2020 **Graduate Instructor for MAT 175: Mathematics for Life Sciences**, *Princeton University.*
- Spring 2020 **Grader for MAT 202 - Linear Algebra**, *Princeton University.*
- Fall 2019 **Grader for MAT 365 - Topology**, *Princeton University.*
- 2015 - 2018 **Math Support Center, Tutor**, *Cornell University.*
- 2016 **Course Assistant**, MATH 1021: Support course for Linear Algebra.
- Fall 2016 **Grader**, MATH 1105: Finite Math for Life Sciences.

Summer Schools and workshops attended

- July 2019 **Park City Math Institute (PCMI).**
Graduate Summer School on Quantum Field Theory and Manifold Invariants
- April 2019 **MIT Talbot workshop**, *Moduli spaces of manifolds.*
Gave a talk on isotopy classes of diffeomorphisms of highly connected manifolds.
- June 2018 **Princeton Summer School on Low dimensional topology and Symplectic Geometry.**

Talks and Conferences

- June 2020 **GROOT seminar (online)**, *Knotted 3-balls in S^4* .
- May 2020 **GT GAPS (online)**, *Kontsevich invariants*.
- October 2019 **Princeton Graduate Student Seminar**, *Topology and trivalent graphs: Kontsevich invariants*.
- May 2019 **Temple GSCAGT**, *Invariants of 2-knots*.
Expository talk on an analogue of finite type invariants for ribbon 2-knots
- Apr 2018 **Cornell Undergraduate Math Club**, *Solving the word problem*.
Talked about the word problem for groups
- Aug 2017 **Young Mathematicians Conference**, *Cusps of Hyperbolic Knots*.
Research talk presenting results from SMALL REU
- Aug 2016 **MAA MathFest**, *The Geometry of Knots*.
Research talk presenting results from SMALL REU
- Aug 2016 **Unknot III Conference**, *Cusps of Hyperbolic Knots*.
Research talk presenting results from SMALL REU

Papers

- Jan 2017 **Densities of Hyperbolic Cusp Invariants**, with C. Adams, R. Kaplan-Kelly, M. Moore, B. Shapiro, J. Wakefield, *Proceedings of the American Mathematical Society*. 146. 10.1090/proc/14068.
- Sep 2019 **Support Equalities Among Ribbon Schur Functions**, with M. Gaetz, W. Hardt, *The Electronic Journal of Combinatorics*, Volume 26 Issue 3. <https://doi.org/10.37236/8229>.
- Apr 2020 **Cyclic Sieving for Cyclic Codes**, with A. Mason, V. Reiner, <https://arxiv.org/abs/2004.11998>.

Research Interests

Low Dimensional Topology, Knot Theory, Knotted Surfaces, Configuration spaces, Finite Type invariants, Embedding calculus

Graduate Coursework

- Princeton 4 Dimensional knot theory, Heegard Floer homology, Knot Invariants and Knot Floer Homology, Embedding Spaces and Diffeomorphism Groups
- Cornell Algebraic Topology, Differential Topology, Hyperbolic Geometry, K-theory and Characteristic Classes, Geometric Group Theory, Algebra 1 and 2, Real Analysis, Complex Analysis, Algebraic Number Theory

Programming languages

Java, Sage, C++, Mathematica, \LaTeX

Outreach and Volunteer Activities

- 2020 **Mentor**, *Undergraduate Directed Reading Program*, Princeton University.
- 2018 - current **Mentor**, *Mentoring Mobius program*, Princeton University.
- 2019 - current **Co-Organizer**, *Math Department Friday Social Events*, Princeton University.
- 2019 - current **Member**, *Math Department Graduate Student Committee*, Princeton University.
- 2018 **Proctor**, *PUMAC Math Contest*, Princeton University.
- 2018 **Undergraduate mentor**, *Zigzag mentoring program*, Cornell University.
- 2018 **Volunteer**, *Expanding Your Horizons*, Cornell University.
- 2017 **Peer Advisor**, *College of Arts and Sciences*, Cornell University.
- 2015, 2016 **Instructor**, *Splash at Cornell*, Cornell University.

Website

<https://web.math.princeton.edu/~ssridhar>