Sayantika Mondal

PhD Student · Mathematics
Graduate Center, City University of New York
sayantikamondal.github.io | smondal@gradcenter.cuny.edu | Interests - Low dimensional Topology, Hyperbolic Geometry, Teichmuller Theory

Education & Appointments

Fordham University — *New York, USA*
Peter M. Curran Visiting Assistant Professor — *August 2026 –*

The Graduate Center, City University New York — *New York, USA*
PhD student in Mathematics — *August 2020 - July 2026*
Advisor: Ara Basmajian

The Graduate Center, City University New York — *New York, USA*
M. Phil — *March 2023*

Indian Institute of Science Education and Research, Pune — *Pune, India*
5 Year Intergrated BS-MS — *August 2015 - June 2020*

- CGPA - 9.3| Graduated with Distinction

DAV Model School, IIT, Kharagpur — *West Bengal, India*
2015

- 12 th Grade | Percentage- 95.2
- 10 th Grade | CGPA - 10

Research

Distinguishing curve types and designer metrics — *2025*
Joint with · Ara Basmajian
- Studying length infima over the Teichmuller space for filling closed curves on hyperbolic surfaces and its relations to self-intersection number of curves. We construct curves with same intersection number but different length infimum.
- arXiv:2508.08539

Estimating distances in simplicial complexes with applications to 3-manifolds and handlebody-knots — *2025*
Joint with · Puttipong Pongtanapaisan, Hahn Vo
- Understanding relation between distances in curves and pants complexes with applications to handelbody links in 3-manifolds
- arXiv:2505.00815

Infimum lengths of filling curves on surfaces with boundary — *Forthcoming*
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- Constructing filling curves on surfaces with boundary and their inf lengths.

The inf spectrum of moduli space. — *Forthcoming*
Joint with · Ara Basmajian, Hugo Parlier
- Improving the upper bound from doubly-exponential to exponential, and showing the designer metrics realizing the spectrum are dense in the thick part of moduli space.

Asymptotic Enumeration of Minimally Intersecting Filling Curve Systems on Closed Surfaces. — *Forthcoming*
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- Counting mapping class group orbits of minimal filling curve systems by encoding them as unicellular 4-regular ribbon graphs and applying symmetric-group character theory; obtaining asymptotics and the best known bound on the number of minimal filling single curves.

Effective density of designer metrics — *In progress*
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- Making the density of designer (optimal) metrics in Teichmuller space quantitative by constructing explicit filling curves whose designer metrics approximate a prescribed hyperbolic structure, with effective length bounds.

Non simple curve complexes — *In progress*
Joint with · Meenakshy Jyothis

- Constructing complexes of curves that include non-simple curves in addition to simple ones

Past Projects

Contact Structures and foliations via open books — *Australian National University*

Maters Thesis · Joan Licata — *May, 2019 - May 2020*

- Understanding relations between contact structures and foliations via open book decompositions.

Formalization of Quasi Isometries — *Universität Regensburg, Germany*

DAAD-WISE Summer Internship · Clara Löh — *May, 2018 - Jul, 2018*

- Read: Introduction to Geometric Group Theory by Clara Löh.
- Learnt to use Isabelle to check proofs and formalised theorems about quasi isometries using Isabelle.

Application of Number Theory in Coding Theory and Cryptography — *HRI, Allahabad, India*

SRFP - Indian Academy of Sciences · B. Ramakrishnan — *May, 2017 - Jun, 2017*

- Read: A First Course In Coding Theory by Raymond Hill.
- An Introduction To Mathematical Cryptography by Jeffrey Hoffstein, Jill Pipher and Joseph H Silverman.

Diffusion in Ehrenfest Gas — *BARC, Mumbai, India*

NIUS Physics Project · Sudhir R. Jain — *May, 2016 - Dec, 2017*

- The main objective is to determine diffusion coefficient of the Ehrenfest Model.
- Also analyzing relation between shape of reflectors and diffusion rates.

Ecocriticism — *IISER, Pune, India*

Summer Project · Pooja Sancheti — *May, 2016 - Jun, 2016*

- Ecocritical analysis of Amitava Ghosh's novel "The Hungry tide", trying to understand the relationship between conservation and humanity.

Grants and Achievements

2026	Bowker Travel Award	*Graduate Center*
2025	Student Conference Organizer Award	*Graduate Center*
2025	Student Travel Award	*Graduate Center*
2025	Black and Schwartz Science Conference Travel Award	*Graduate Center*
2024	Claire Booth Luce Fund Travel award	*Graduate Center*
2024	Doctoral Student Research Grant	*Graduate Center*
2024	Hunter Faculty Travel award	*Hunter College*
2023	Umesh & Shailaja Nagarkatte Fellowship	*Graduate Center*
2023	GC Conference Presentation Support	*Graduate Center*
2023	Open Knowledge fellowship	*Graduate Center*
2022	Nagarkatte Travel award	*Graduate Center*
2022	Provost's Pre-Dissertation Summer Science Research Grant	*CUNY*
2022	Doctoral Student Research Grant	*Graduate Center*
2019	Future Research Talent Fellowship	*ANU, Australia*
2018	DAAD WISE Summer Research Fellowship	*UR, Germany*
2018	SN Bose Fellowship (Nominated)	
2017	Science Academies' Summer Research Fellowship	*HRI, Allahabad*
2016	National Initiative on Undergraduate Science(NIUS) Fellowship	*HBCSE(TIFR)*
2014	Kishore Vaigyanik Protsahan Yojna (KVPY) Fellowship-SX (Rank- 888)	

Teaching

S'26	Math 1109: Math for Business: Calculus, Math 1207: Calculus II	*Fordham*
F'25	Math 1206: Calculus I and Recitation, Math 12550.05 Precalculus Recitation	*Fordham, Hunter*
Sum'25	Math 1109: Math for Business: Calculus	*Fordham*
S'25	Math 1109: Math for Business: Calculus, Math 12550.R014 Precalc Recitation, Math 2009 Precalc	*Fordham, Hunter, Baruch*
F'24	Math 1100: Finite Math, Math 12550.R016 Precalculus Recitation, Math 1030 College Algebra	*Fordham, Hunter, Baruch*
S'24	Math 12550.R015 Precalculus, Math 2003 Precalculus and Elememnts of Calculus Recitation	*Hunter, Baruch*
F'23	Math 1023 College Algebra, Math 12550.R016 Precalculus Recitation	*Baruch, Hunter*
S'23	Math 12550.14 Precalculus, Math 12550.R014 Precalculus Recitation	*Hunter*
F'22	Math 12550.0 Precalc, Math 12550.02 Precalc	*Hunter*

Invited Talks

Jun 2026	Seminar talk	*U Tübingen*
Mar 2026	Seminar Talk	*Paris-Saclay*
Sep 2025	Seminar Talk	*Yale University*
Apr 2025	Binghamton Geometry and Topology seminar	*Binghamton*
Mar 2025	Geometric Group Theory session, 58th Spring Topology and Dynamics Conference	*Virginia*
Jan 2025	JMM 2025	*Seattle*
Nov 2024	CUNY Dynamics and Complex geometry Seminar	*GC CUNY*
Apr 2024	ASU Geometry Seminar	*Arizona*
Mar 2024	SMART workshop	*Luxembourg*
Nov 2023	Hyperbolic Geometry Seminar	*Graduate Center, NY*
Aug 2023	Seminar Talk	*IISER Pune, India*
July 2023	Shimane University Seminar	*Japan*
June 2023	Geometry-Topology student seminar	*Graduate Center, NY*

Extracurricular Activity

- Member of the Research committee of the Graduate Center
- Volunteer with Make-a-wish
- CUNY Women in STEM group leader
- Co-chair for Student Activities for the Graduate Center Student Government (2023-2024)
- President of the GC AWM Chapter (2022-2024)
- Officer for Student Life and Services at the Graduate Center for the academic year 2022-2023
- CUNY organizer for ENYGMMa seminar
- Mentored two undergrad students reading projects as part of a CUNY DRP program
- Organized the Graduate student colloquium at Graduate Center
- I help mentor and guide undergraduates especially from India to navigate research and grad school applications abroad.
- Pursued Fine Arts, Bharatnatyam and Recitation for 15 years and obtained Diploma.
- First prize in Essay writing competition as a part of International Workshop on Biodiversity and Climate Change, 2010 at IIT Kharagpur.
- Honorable Mention in All India Essay Writing Competition organised by UNIC and SRCM in 2011, 2012 and 2013.
- I was the Coordinator of the Mathematics Club at IISER Pune (2017-2018).
- Served as the Mimamsa Publicity Coordinator (2017) and Part of the Math question making team.