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

The Graduate Center, City University New York   *New York, USA*

4th year PhD student in Mathematics   *August 2020 - Present*

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
- Courses (Mathematics) - Single and Multi Variable Calculus, Introduction to Proofs, Linear Algebra, Basic Structures in Mathematics, Probability and Statistics, Analysis, Group Theory, Point Set Topology, Combinatorics, Complex Analysis, Calculus on Manifolds, Rings and Modules, Fourier Analysis, Graph Theory, Algebraic Topology, Measure Theory, Galois theory, ODE, Representation Theory, Differential Geometry, Algebraic Number Theory, Cryptography, Functional Analysis

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

                                                                                2015

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

Research

Length infima of filling curves on hyperbolic surfaces

Joint with · Ara Basmajian

- Study length infima over the Teichmuller space for filling closed curves on hyperbolic surfaces. In particular explore relations between this infimum and self-intersection number of curves. We construct curves with same intersection number but different length infimum.

Past Projects

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

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

- Aim: To understand relations between contact structures and foliations via open book decompositions.

Teichmüller Theory   *IISER, Pune, India*

Semester Project · Chitrabhanu Chaudhuri   *Aug, 2018 - Apr, 2019*

- Aim: To learn about Teichmüller Spaces via hyperbolic geometry.

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.

Differential Topology   *IISER, Pune, India*

Semester Project · Vivek M. Mallick   *Jan, 2018 - Apr, 2018*

- Read: Differential Topology by Alan Pollack and Victor Guillemin.(First 2 chapters).

Quantum Algorithms and their application in Cryptography

IISER, Pune, India

SEMESTER PROJECT · AYAN MAHALANOBIS

Aug, 2017 - Nov, 2018

- Read : Quantum Computer Science by N David Mermin.

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.
- A Course In Number Theory And Cryptography by Neal Koblitz.

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.

Introduction to Cryptography

IISER, Pune, India

SUMMER PROJECT · SOUMEN MAITY

Jul, 2016

- Read : Introduction to Cryptography by Johannes Buchmann (few chapters).

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.
- Read: Ecocriticism by Greg Garrad.

Grants and Achievements

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)	
2014	Qualified National Standard Examination in Chemistry	
2014	Qualified National Standard Examination in Biology	
2012	Australian Mathematics Competition(Certificate of Credit)	
2012	National Standard Examination in Junior Science (Top 10%)	

Teaching

F'23	Math 1023 College Algebra	*Baruch College*
F'23	Math 12550.R016 Precalculus Recitation	*Hunter College*
S'23	Math 12550.14 Precalculus	*Hunter College*
S'23	Math 12550.R014 Precalculus Recitation	*Hunter College*
F'22	Math 12550.06 Precalculus	*Hunter College*
F'22	Math 12550.02 Precalculus	*Hunter College*

Talks

Mar 2024	SMART workshop	*Luxembourg*
Dec 2023	Iberoamerican Congress on Geometry	*Pucon, Chile*
Nov 2023	BUGCAT	*Binghampton, NY*
Nov 2023	Hyperbolic Geometry Seminar	*Graduate Center, NY*
Aug 2023	Seminar Talk	*IISER Pune, India*
July 2023	Shimane University Seminar	*Japan*
April 2023	Complex dynamics mini conference	*Utah*
June 2023	Geometry-Topology student seminar	*Graduate Center, NY*
Jan 2023	Log Cabin Workshop	*Arizona*
Aug 2022	Workshop on Big Mapping Class groups	*Boston College*
July 2022	Metric Geometry CXoncentration week	*Texas A & M*
Feb 2022	Lightning Talk	*Graduate Center*

Extracurricular Activity

- I'm am the Co-chair for Student Activities for the Graduate Center Student Government (2023-2024)
- I'm am the President of the GC AWM Chapter (2022-2024)
- I'm was Officer for Student Life and Services at the Graduate Center for the academic year 2022-2023
- I'm am the 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.
- I have pursued Fine Arts, Bharatnatyam and Recitation for around 15 years and have obtained Diploma in them from Pracheen Kala Kendra (National Board).
- Received first prize in Essay writing competition as a part of International Workshop on Biodiversity and Climate Change, 2010 at IIT Kharagpur.
- Received 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).
- I was a part of the Math question making team for Mimamsa - A national level science quiz for undergraduates conducted by IISER Pune.