Sayantika Mondal

PhD Student · Mathematics

Graduate Center, City University of New York

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Education

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

3RD YEAR PhD STUDENT IN MATHEMATICS   *August 2020 - Present*

Advisor: Ara Basmajian

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

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%)	

Conferences and Workshops

2022	Workshop on Big Mapping Class Groups	*Boston College*
2022	Metric Geometry Concentration week	*Texas A & M*
2022	Geometry, arithmetic, and groups	*UT Austin*
2022	The Circle at infinity	*Harvard University*
2022	Reflections on Geometry:3-Manifolds, Groups and Singularities	*Columbia University*
2022	Graduate Student Conference in Algebra, Geometry, and Topology	*Temple University*
2022	Structers on surfaces	*CIRM, Marseilles*
2022	Braids in Low dimensional Topology	*ICERM*
2022	Workshop on dynamical system and related topics	*U Maryland*
2018	Workshop on Volume Conjecture and Related Topics in Knot Theory	*IISER, Pune*
2017	Summer Program In Mathematics	*HRI, Allahabad*
2015	National Science Camp (Vijyoshi)	*IISc, Bangalore*
2012	RMO Training Camp	*ISI, Kolkata*
2012	Pre RMO Training Camp	*IIT, Kharagpur*

Talks

2022	Geodesically complete hyperbolic structures	*Boston College*
2022	Length infima of non-simple closed curves	*Texas A & M*
2022	Contact structures to foliations and back	*Graduate Center*

Extracurricular Activity

- I'm the Officer for Student Life and Services at the Graduate Center for the academic year 2022-2023
- Organized the Graduate student colloquium at Graduate Center.
- Part of the Geometry and topology seminar group at CUNY and an active speaker.
- Part of the Hyperbolic seminar group and Teichmüller theory reading group.
- 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'm a part of the Math question making team for Mimamsa - A national level science quiz for undergraduates conducted by IISER Pune.
- Served as the Head Girl (2014-2015) and House captain (2013-2014) of my school.
- Won 1st prize in 800m (interschool) and ran marathons.