Nilava Metya

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Education

Rutgers, The State University of New Jersey - New Brunswick — **September '22 – (expected) '27**
Doctor of Philosophy in Mathematics — *New Brunswick, New Jersey, USA*
(passed through written qualifying exams in first attempt just before program started)

Chennai Mathematical Institute — **August '19 – (expected) April '22**
Bachelor of Science (Honours) in Mathematics and Computer Science | ***CGPA:*** $9.72/10$ — *Chennai, Tamil Nadu, India*
Position: ***Third*** *(out of* 55 *students)*

Don Bosco School, Liluah — **April '06 – March '19**
Indian School Certificate (ISC) *2019* | ***Percentage:*** 97.25%
Position: ***First*** *in science stream (*~ 55 *students),* ***second*** *overall (*~ 180 *students)* — *Howrah, West Bengal, India*
Indian Certificate of Secondary Education (ICSE) *2017* | ***Percentage:*** 96.6%
Position: ***First*** *in school (*~ 180 *students)*

Graduate Coursework

Mathematics

- Quantum computation, Matrix Computations, Representations of algebras and quivers, Algebraic Number Theory, Representation theory (reading + research), Algebraic Geometry 2, Homological Algebra
- Complex Analysis, Measure theory and functional analysis
- Probability Theory, Statistics with R
- Differential Equations, Smooth Manifolds, Algebraic Topology

Computer Science

- Functional Programming (Haskell), Advanced Programming (Python), Object Oriented Programming
- Design and Analysis of Algorithms, Discrete Mathematics, Theory of Computation, Lambda Calculus
- Formal Security Analysis (applied pi calculus, ProVerif, CryptoVerif, F*)

Relevant Reading Projects

Quiver representations and invariants | ***Prof Anne-Marie Aubert*** | Sorbonne University — **June '22**
Read a paper on quivers by Daniele Faenzi, and learnt relevant topics

Markov Chain and Monte Carlo | ***Prof R V Ramamoorthi*** — **August - September '21**
A paper on MCMC by KB Athreya, M Delampady, T Krishnan from Resonance, Volume 8, 2003

p-adic analysis | ***Prof Anup Dixit*** | IMSc, Chennai — **May - July '21**
Neal Koblitz's book 'p-adic Numbers, p-adic Analysis, and Zeta-Functions' and the paper 'The Derivative of p-adic Dirichlet Series at $s = O$' by H M Stark

Representation theory of Lie algebras | ***Prof Apoorva Khare*** | IISc, Bangalore — **May - July '21**
James E Humphreys's book 'Introduction to Lie Algebras and Representation Theory' (till section 7)

Talks Delivered

Burnside p^aq^b theorem | 1 *talk* | Rutgers *Graduate Number Theory Learning Seminar* — **November '22**
Very basic Lie Theory | 1 *talk* | Rutgers *Graduate Geometry and Topology Learning Seminar* — **October '22**
Knaser graph coloring | 1 *talk* | Rutgers *Graduate Combinatorics Seminar* — **October '22**
Well definedness of Brauer group | 1 *talk* | Rutgers *Algebra 'N' GEometry Learning Seminar* — **September '22**
Fiedler vector method | 1 *talk* | Project in a course on matrix computations — **May '22**
Derivative of p-adic Dirichlet series at $s = 0$ (Stark) | 1 *talk* | Internship with *Prof Dixit* — **November '21**
Dehn's proof of Hilbert's 3^{rd} problem | 1 *talk* | CMI Student Seminar — **November '21**
Markov Chain Monte Carlo | 1 *talk* | Internship with *Prof Ramamoorthi* — **September '21**
Lie Algebras and Representation Theory | 3 *talks* | Counselor Seminar at *PROMYS* — **July - August '21**
Introduction to Hyperbolic Geometry | 1 *talk* | Counselor Seminar at *PROMYS* — **July '21**
Introduction to Quantum Computing | 4 *talk* | Counselor Seminar at *PROMYS* — **July - August '20**

Teaching and Grading

Grader | Rutgers University

Topology			Sep–Dec '22
Theory of Numbers			Sep–Dec '22

Teaching Assistant | Chennai Mathematical Institute

Algebra II (Group theory)	*BSc 1st year*	***Prof Manoj Kummini***	Jan–May '22
Algebra I (Linear algebra)	*BSc 1st year - head tutor*	***Prof T R Ramadas***	Sep–Dec '21
Functional Programming in Haskell	*BSc and MSc Comp. Sci. 1st year*	***Prof S P Suresh***	Sep–Dec '21
Probability Theory	*BSc 1st year*	***Prof P Sankaran***	Apr–Jul '21
Discrete Mathematics	*BSc 1st year*	***Prof K V Subrahmanyam***	Apr–Jul '21
Design and Analysis of Algorithms	*MSc Data Science 1st year*	***Prof G Philip***	Apr–Jul '21
Algebra I (Linear algebra)	*BSc 1st year*	***Prof T R Ramadas***	Dec'20 –Mar '21
Functional Programming in Haskell	*BSc and MSc Comp. Sci. 1st year*	***Prof S P Suresh***	Dec'20 –Mar '21

Counselor at PROMYS | Boston University **Jul–Aug '21**

Counselor at PROMYS | Boston University **Jul–Aug '20**

Skills

Languages	Bengali (mother tongue), English (fluent), Hindi (fluent), German (beginner)
Programming	JAVA, C++, Python, Haskell, R, HTML
Documentation	LaTeX

Honours and Awards

Academic Excellence Award at Rutgers **2022**
Received a certificate and $100 based on performance in Written Qualifying Exams.

Shriram Scholarship at CMI **2019 – '22**
Received institutional fee waiver and monthly stipend.

Ranked 4^{th} nationally at the *Bachelor of Statistics* (B.Stat.) entrance examination **2019**
Indian Statistical Institute (ISI)

Informatics Olympiad **2017, '18, '19**
*Selected among (approx) top 100-130 school students in India in **Zonal Informatics Olympiad** (ZIO).*

Mathematical Olympiad **January '18**
*Selected for **Indian National Mathematical Olympiad** (INMO) **Training Camp** — top 30 school students in West Bengal.*

Program in Mathematics for Young Scientists (PROMYS) **2018, '19, '20, '21**
*Awarded the **Tara and Jasubhai Mehta Fellowship** to PROMYS (among 5 Indian school students in 2018) based on a competitive process. Participated twice as a student ('18, '19) and twice as a counselor ('20, '21).*

Others

- Qualified for **International Collegiate Programming Contest** (ICPC) Kharagpur regionals and Amritapuri regionals in 2019 and secured rank 35 among (approx) 90 university teams at Kharagpur.
- Selected among top 30 students in India to participate in **Scholastic Test of Excellence in Mathematical Sciences** (STEMS) camp at CMI in 2018, based on a competitive exam.
- Secured the **third position** in **Mathematics Talent Reward Programme** (MTRP) 2016, organized by ISI Kolkata, based on a competitive exam and quizzes at a camp.

Outreach/Activities

Organized a student seminar at CMI. **October - December '21**

Volunteered to teach Combinatorics at (online) ICO Camp, organized by Codechef. **November '20**

Interacted with students of Don Bosco School, Liluah to spread scientific awareness. **December '19**