Nilava Metya

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Education

Rutgers, the State University of New Jersey - New Brunswick — **Sep '22 – (expected) '27**
Piscataway, New Jersey, USA
Doctor of Philosophy in Mathematics | ***CGPA:*** 4.0/4.0
(passed written qualifying exams in first attempt just before program started)

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

Don Bosco School, Liluah — **Apr '06 – Mar '19**
Howrah, West Bengal, India
Indian School Certificate (ISC) 2019 | ***Percentage:*** 97.25%
Position: ***First*** *in science stream (∼ 55 students),* ***second*** *overall (∼ 180 students)*
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, Theory of Sheaves and Schemes, Homological Algebra
- Complex Analysis, Measure theory and functional analysis
- (Measure theoretic) 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 / Internships

Quantum information (representation theory) | ***Siddhartha Sahi*** | Rutgers University — **Sep – Dec '22**
Reading Dr. Christandl's thesis titled 'The Structure of Bipartite Quantum States - Insights from Group Theory and Cryptography'; weekly discussions

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

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

p-adic analysis | ***Anup Dixit*** | IMSc, Chennai — **May - Jul '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 | ***Apoorva Khare*** | IISc, Bangalore — **May - Jul '21**
James E Humphreys's book 'Introduction to Lie Algebras and Representation Theory'

Participations in conferences/workshops

Algebraic Methods in Biochemical Reaction Networks | *upcoming Workshop* | MPI, Leipzig — **Jun '23**
Joint Mathematics Meetings | *Conference* | Boston — **Jan '23**
AlGeCom-XII (Algebra Geometry and Combinatorics day) | *Workshop* | UIUC — **Oct '22**
Conference on modular forms (honor of Prof Ramakrishnan) (online) | *Workshop* | IMSc, Chennai — **Sep '21**
Elliptic curves and the special values of L-functions (online) | *Workshop* | ICTS, Bangalore — **Aug '21**

Teaching and Grading

Head Counselor at PROMYS India | IISc Bangalore — **May – Jun '23**

Grader | Rutgers University

Analysis II	Jan – Apr '23
Topics in Applied Algebra	Jan – Apr '23
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 '20, '21**

Talks Delivered

GCT III: deciding positivity of LR coefficients | 1 *talk* | Rutgers *CS Theory Reading Seminar* — **Apr '23**
Quiver Reps - geometry & invariants | 1 *talk* | Rutgers *Algebra 'N' Geometry Learning Seminar* — **Apr '22**
Quiver Reps - Intro | 1 *talk* | Rutgers *Graduate Algebra and Representation Theory Seminar* — **Dec '22**
Burnside p^aq^b theorem | 1 *talk* | Rutgers *Graduate Number Theory Learning Seminar* — **Nov '22**
Very basic Lie Theory | 1 *talk* | Rutgers *Graduate Geometry and Topology Learning Seminar* — **Oct '22**
Kneser graph coloring | 1 *talk* | Rutgers *Graduate Combinatorics Seminar* — **Oct '22**
Well definedness of Brauer group | 1 *talk* | Rutgers *Algebra 'N' GEometry Learning Seminar* — **Sep '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* — **Nov '21**
Dehn's proof of Hilbert's 3^{rd} problem | 1 *talk* | CMI Student Seminar — **Nov '21**
Markov Chain Monte Carlo | 1 *talk* | Internship with *Prof Ramamoorthi* — **Sep '21**
Lie Algebras and Representation Theory | 3 *talks* | Counselor Seminar at *PROMYS* — **Jul – Aug '21**
Introduction to Hyperbolic Geometry | 1 *talk* | Counselor Seminar at *PROMYS* — **Jul '21**
Introduction to Quantum Computing | 4 *talks* | Counselor Seminar at *PROMYS* — **Jul – Aug '20**

Honours and Awards

Academic Excellence Award at Rutgers — **Sep '22**
Received a certificate and $100 based on performance in Written Qualifying Exams.

Shriram Scholarship at CMI — **'19 – '22**
Received institutional fee waiver and monthly stipend (based on entrance exam).

Ranked 4^{th} nationally at the *Bachelor of Statistics* (B.Stat.) entrance examination — **'19**
Indian Statistical Institute (ISI)

Informatics Olympiad — **'17, '18, '19**
*Selected among (approx) top 100-130 school students in India in **Zonal Informatics Olympiad** (ZIO).*

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

Program in Mathematics for Young Scientists (PROMYS) — **'18, '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.

SERVICE

Diversity, Equity, and Inclusion Grad Advisory Committee | *Member* | SGS, Rutgers University **Jan - Dec '23**
Algebra 'N' Geometry Learning Seminar (ANGeLS) | *Organizer* | Rutgers math department **Jan - May '23**
Student Seminar | *Organizer* | Chennai Mathematical Institute **Oct - Dec '22**
ICO Camp (online) | *Combinatorics teacher* | CodeChef **Nov '20**

SKILLS

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