

NILAVA METYA

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EDUCATION

Rutgers, the State University of New Jersey - New Brunswick

Doctor of Philosophy in Mathematics | CGPA: 4.0/4.0

(passed written qualifying exams in first attempt just before program started)

Sep '22 – (expected) '27

Piscataway, New Jersey, USA

Chennai Mathematical Institute

Bachelor of Science (Honours) in Mathematics and Computer Science | CGPA: 9.72/10

Position: *Third* (out of 55 students)

Aug '19 – May '22

Chennai, Tamil Nadu, India

Don Bosco School, Liluah

Indian School Certificate (ISC) 2019 | Percentage: 97.25%

Position: *First* in science stream (~ 55 students), *second* overall (~ 180 students)

Apr '06 – Mar '19

Indian Certificate of Secondary Education (ICSE) 2017 | Percentage: 96.6%

Position: *First* in school (~ 180 students)

Howrah, West Bengal, India

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 $s = 0$ ' 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

April '23

Quiver Reps - geometry & invariants | 1 talk | Rutgers Algebra 'N' Geometry Learning Seminar

March '22

Quiver Reps - Intro | 1 talk | Rutgers Graduate Algebra and Representation Theory Seminar

Dec '22

Burnside $p^a q^b$ 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 4th 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