Ayan Nath

Graduate Student

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Education

Massachusetts Institute of Technology (MIT) — Cambridge, MA
Ph.D. in Mathematics — *September 2024 – present*

Chennai Mathematical Institute — Chennai, India
Bachelor of Science (Honours) in Mathematics and Computer Science — *September 2021 – April 2024*

Talks

2024 **Almost purity**, Reading seminar on perfectoid spaces (Fall 2024), Harvard

Tilting equivalence for perfectoid algebras, Reading seminar on perfectoid spaces (Fall 2024), Harvard

Special cycles on unitary Shimura varieties, Learning Seminar on Arithmetic Inner Product Formula (Fall 2024), MIT

Artin-Verdier duality for function fields, talk delivered as part of the assessment for the Geometric Class Field Theory elective course, Chennai Mathematical Institute.

Hodge-Tate decomposition for abelian varieties with good reduction, talk delivered as part of the assessment for the Topology of Algebraic Varieties elective course, Chennai Mathematical Institute.

2023 **Ribet's converse to Herbrand's theorem**, CMI-IMSc Number Theory Seminar.

Alterations, CMI Student Seminar. Slides: ayan7744.github.io/alterations-slides.pdf.

Mod p local Langlands correspondence for $\mathbf{GL}_2(\mathbb{Q}_p)$, talk delivered as part of the culmination of the TIFR Visiting Students' Research Program. Slides: ayan7744.github.io/vsrp-slides.pdf.

Resolution of Singularities in Arbitrary Characteristic, talk delivered as part of the assessment for the Algebraic Geometry II elective course, Chennai Mathematical Institute.

2022 **The Cohen-Macaulay property of invariant rings**, talk delivered as part of the assessment for the Commutative Algebra elective course, Chennai Mathematical Institute.

Publications

- Ayan Nath and Abhishek Jha, *On the Least Common Multiple of Polynomial Sequences at Prime Arguments*, **International Journal of Number Theory**, 18(06), 1227-1237, doi:10.1142/S1793042122500622 (2022)
- Ayan Nath and Abhishek Jha, *On Quotients of Values of Euler's Function on Factorials*, **Bulletin of the Australian Mathematical Society**, 105(3), 353-364, doi:10.1017/S0004972721000939 (2021)
- Ayan Nath, *On the divisibility* $a! + b! \mid (a + b)!$, **The American Mathematical Monthly**, 129(3), 246-254, doi:10.1080/00029890.2022.2010495 (2022)

Teaching Experience

Teaching Assistant (Chennai Mathematical Institute)

- **Calculus 1** (Multidimensional differential calculus) — *January 2024 - April 2024*
- **Calculus 2** (Multidimensional integral calculus) — *August 2023 – December 2023*
- **Analysis 2** (Point-set topology, function spaces, Fourier analysis, etc) — *August 2023 – December 2023*
- **Discrete Mathematics** — *January 2023 – April 2023*

Workshops

- **Hida Theory and Iwasawa Main Conjecture over** $\mathbb{Q}$, Chennai Mathematical Institute — *December 2023*
- **Rational Points on Modular Curves**, ICTS-TIFR — *September 2023*

- **Dualities in Topology and Algebra**, ICTS-TIFR *May 2023*
- **Elliptic curves and the special values of L-functions**, ICTS-TIFR *August 2022*

Achievements

2024 **CMI Medal of Excellence**, top of class.

Akamai Presidential Fellowship, Massachusetts Institute of Technology.

2022 **SRIRAM Scholarship**, tuition fee waiver and monthly stipend for undergraduate studies.

Spirit of Ramanujan

Indian National Mathematical Olympiad Awardee (2019, 2020, 2021), Homi Bhabha Centre For Science Education

Miscellaneous

Languages Python

Tools LaTeX, PARI/GP