

# Ayan Nath

Graduate Student

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## EDUCATION

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### Massachusetts Institute of Technology (MIT)

*Ph.D. in Mathematics*

Cambridge, MA

September 2024 – present

### Chennai Mathematical Institute

*Bachelor of Science (Honours) in Mathematics and Computer Science*

Chennai, India

September 2021 – April 2024

## TALKS

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- 2024 **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](https://ayan7744.github.io/alterations-slides.pdf).
- Mod  $p$  local Langlands correspondence for  $GL_2(\mathbb{Q}_p)$** , talk delivered as part of the culmination of the TIFR Visiting Students' Research Program. Slides: [ayan7744.github.io/vsrp-slides.pdf](https://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

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- 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](https://doi.org/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](https://doi.org/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](https://doi.org/10.1080/00029890.2022.2010495) (2022)

## TEACHING EXPERIENCE

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### 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

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- 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

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

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Languages Python  
Tools  $\text{\LaTeX}$ , PARI/GP