

# Xingyu Zhong (钟星宇)

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Profile Mathematics undergraduate ranked 1/27 with ICPC background, Lean 4 formalization experience, mathlib4 contributions, and hands-on development experience in theorem-prover tooling, frontend systems, and publishing/CLI infrastructure. Interested in AI4Math benchmarks, agent-assisted formalization, and reliable evaluation workflows.

## Education

Beijing Institute of Technology B.Sc. in Mathematics 2022.08 – 2026.06

- GPA: 3.9 / 4.0 (94); rank: 1 / 27.
- Selected courses: C Programming, Parallel Computing, Commutative Algebra, Elementary Algebraic Geometry, Combinatorics, Abstract Algebra, General Topology, Lie Algebras, Representation Theory.

National University of Singapore M.Sc. in Mathematics Starting 2026

- Incoming master's student in Mathematics.

## Undergraduate Thesis

Nilpotent Orbits in Classical Lie Algebras 2025 – 2026

- **Academic:** Studied nilpotent orbit classification over  $\mathbb{C}$ , closure order, and dominance order on partitions; developed a diagrammatic method for constructing algebraic deformations between nilpotent orbits of different Jordan types.
- **Engineering:** Formalized dominance-order cover relations for admissible partitions of classical types in Lean 4. Human-in-the-loop agentic proof engineering with Lean LSP, compiler diagnostics, and proof-state feedback for large-scale, fast-paced mathematical formalization project.
- Links: [thesis](#), [slides](#), [Lean repository](#).

## Internships

BICMR–Ubiquant AI4Math Internship Data Annotation Team 2025.07 – 2025.12

- Annotated and formalized abstract algebra definitions and theorems using the Lean 4 interactive theorem prover.

## Selected Projects and Contributions

mathlib4 Lean / Open Source

- Contributed 6 public PRs, 3 merged; topics include Nakayama's lemma, span rank, and cotangent spaces.

Lean 4 Static InfoView Lean / Frontend

- Built a static Lean 4 InfoView prototype that extracts proof states, tactic states, and term types from Lean files into HTML, enabling presentation and inspection without a live Lean server.

Weyl Canvas Visualization / Frontend

- React / Vite / Zustand, interactive illustration editor for affine Weyl groups with SVG / TikZ export.

Quarto / Pandoc Ecosystem Lua / Publishing Tooling / Open Source

- Maintained [SUNQUARTeX](#), a Quarto-based multi-format Chinese / English academic writing template; developed Quarto extensions and Lua filters including theorem / callout presentation and independent document rendering.

## Honors and Competitions

- **Scholarships:** National Scholarship (国家奖学金); Baosteel Scholarship for Outstanding Students (宝钢优秀学生奖); Samsung Scholarship; Zhenyong Fei Scholarship (费振勇奖学金) 2022 – 2026
- **Honors:** Outstanding Graduate of Beijing Municipality (北京市优秀毕业生); Outstanding Graduate of BIT (校优秀毕业生); Model Student (优秀学生标兵); Outstanding Student (优秀学生) x2 2022 – 2026
- **ICPC / CCPC:** 1 gold, 4 silver, and 2 bronze in national, regional, and invitational contests. 2023 – 2024
- **Codeforces rating:** 1951
- **Alibaba Global Mathematics Competition**, Finalist 2024

## Teaching and Service

Introduction to Formal Mathematics with Lean 4 Organizer / Lecturer 2025.09 – 2025.12

- Organized and lectured a 12-week extracurricular Lean 4 course for BIT undergraduates; produced online notes, PDF book, repository, examples, and exercises.

Programming Contest Problem Setting and Teaching 2023 – 2024

- Problem setter for 2023 BITCPC and 2024 ICPC Asia Kunming Regional; lecturer for BITACMCLUB summer training on DFT / FFT, convolution, and related mathematical background.

## Skills

**Programming** Python, C++, Lean 4, Typescript, React.

**Tooling** Git, CLI tools, Linux, Lua filters, Quarto, Pandoc,  $\LaTeX$ .

**Languages** Native Chinese; IELTS Academic 7.5; CET-6 581; CET-4 650.