Bryan Lu

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Education

University of Washington Ph.D. Candidate in Mathematics — Sep 2024 – Present

Cornell University BA Mathematics, Computer Science — Sep 2020 – Dec 2023

- *summa cum laude* with Honors, Phi Beta Kappa
- **Thesis:** Branching Rules for the 0-Hecke Algebra

Publications/Preprints

Acyclic complexes of 0-Hecke modules (with Ayah Almousa) — in preparation

On the nature and complexity of an impartial two-player variant of the game Lights-Out (with Eugene Fiorini, Maxwell Fogler, Katherine Levandosky, Jacob Parter, Andrew Woldar). Submitted. arxiv.org/2411.08247

Presentations

Ehrhart theory via sheaf cohomology of toric varieties (Student Algebraic Geometry Seminar, UW) — October 2025

Simplicial complexes and jeu de taquin theory (Joint Mathematics Meetings 2024) — January 2024

Branching rules for the 0-Hecke algebra (Cornell Discrete Combinatorics and Geometry Seminar) — November 2023

Teaching/Mentorship

University of Washington Math Department: Teaching Assistant — Sep 2024 – present

- **MATH 125: Calculus with Analytic Geometry II** — Fall 2024, Winter 2025, Summer 2025
  Supervisors: Charles Camacho, Elena Pezzoli

- **MATH 126: Calculus with Analytic Geometry III** — Spring 2025, Fall 2025
  Supervisors: Charles Camacho, Patrick Perkins

Washington Directed Reading Program (WDRP): Graduate Student Mentor — Spring 2025

- *Computer-Assisted Proofs (with Jonthan Ly, Alexandre Lipson)*: Mentored students in learning homotopy type theory and the Agda proof assistant, following Egbert Rijke's *Introduction to Homotopy Type Theory*

Hampshire College Summer Studies in Mathematics (HCSSiM): Junior Staff — Jul 2024 – Aug 2024

- Mentored talented high school students in undergraduate abstract algebra and combinatorics
- Designed 7-day mini-course on matroids and applications to graph theory
- Wrote daily problem sets with inquiry-based learning in mind and gave feedback to students

Cornell Math Department: Grader for Theoretical Linear Algebra and Calculus (MATH 2230/2240) — Aug 2021 – Dec 2023

AwesomeMath Summer Program: Instructor, Teaching Assistant — Jun 2020 – Aug 2021

Organization

Back-to-School Seminar — Fall 2025

Graduate student lectures on fun math learned over the summer.

First-Year Reading Seminar — Summer 2025

Four mini-talk sessions for first-year graduate students to present on topics of interest.

Reading Seminars

Combinatorial Hopf Algebras — Fall 2025

Symmetric Functions — Spring 2025

Academic Development

UMN Algebra and Combinatorics REU June 2023 – August 2023

- $\mathfrak{S}_n$-equivariant Koszul algebras from the Boolean lattice (with Erin Delargy, Rylie Harris, Jiachen Kang, Ramanuja Charyulu Telekicherla Kandalam) Report
- Simplicial complexes and jeu de taquin theory (with Zeus Dantas e Moura, Dora Woodruff) Report

Moravian University Discrete Mathematics REU June 2022 – July 2022

- Enumerating possible preference orderings of points in the plane (with Erin Delargy, Benjamin Keilty, Dane Sheridan)
- On the nature and complexity of an impartial two-player variant of the game Lights-Out (with Maxwell Fogler, Katherine Levandosky, Jacob Porter)

Projects

JAEK (Just Another Eta Kompiler): x86 Compiler January 2023 – May 2023

- Full end-to-end compiler for C-like language Eta targeting x86 machine code
- Honorable mention for extremely high correctness and high speed of compiled code

agda-unimath: Univalent Mathematics Library August 2022 – December 2022

Formalizing propositions in elementary number theory targeting the development of formalized rational numbers

Awards

Kieval Prize $2000, Cornell Mathematics Department Spring 2024

For academic excellence and contributions to mathematics life at Cornell University.

Skills

Languages: Mandarin Chinese, Spanish, English

Software: Python, Sage, Java, C++, OCaml, Rocq, Agda, Macaulay2