January, 2026

Joey Lakerdas-Gayle

ja2999la@uwaterloo.ca

Education

Doctor of Philosophy in Pure Mathematics Expected August 2027
University of Waterloo
Advisors: Barbara Csima & Andy Zucker

Master of Mathematics in Pure Mathematics August 2023
University of Waterloo
Advisor: Barbara Csima

Honours Bachelor of Science with High Distinction June 2022
University of Toronto
Specialist in Mathematics and Major in Computer Science, CGPA: 3.7/4.0
Dean's List (Awarded for obtaining a CGPA of 3.5 or higher)

Research Interests

Computability theory, infinite combinatorics, computable structure theory, structural Ramsey theory

Awards and Grants

Ontario Graduate Scholarship, May 2025 - April 2026
Queen Elizabeth II Graduate Scholarship, May 2024 - April 2025
Ontario Graduate Scholarship, May 2023 - April 2024

Publications

Isomorphism Spectra and Computably Composite Structures. *Z. Math. Log. Grundlagen Math.*, to appear (2026), pp. 197-210.
DOI: 10.60866/CAM.260.

The lexicographically least square-free word with a given prefix (with Siddharth Berera, Andrés Gómez-Colunga, John López, Mauditra Matin, Daniel Roebuck, Eric Rowland, Noam Scully, and Juliet Whidden). *The Electronic Journal of Combinatorics*, 30 (2023) #P3.11 (43 pages).
DOI: 10.37236/11659.

Preprints

Oscillating subalgebras of the atomless countable Boolean algebra (with Dana Bartošová, David Chodounský, Barbara Csima, Jan Hubička, Matěj Konečný, Spencer Unger, and Andy Zucker).
https://arxiv.org/abs/2505.22603.

Talks

1. *Computability theory of function composition*, 2025 Canadian Mathematical Society Winter Meeting, Toronto, December 8, 2025.
2. *Higher dimension partition principles in uncountable Hausdorff spaces*, Infinite Structural Ramsey Theory, BIRS, Banff, November 24, 2025.
3. *Isomorphism Spectra and Uniform Computable Categoricity*, AMS Fall 2025 Central Meeting Special Session on Computability, Saint Louis University, October 19, 2025.
4. *Weakly Uniform Computable Categoricity*, University of Waterloo Logic Seminar, October 10, 2025.

5. *Isomorphism Spectra and Computably Composite Structures*, The 25th Graduate Student Conference in Logic, University of Notre Dame, April 27, 2025.
6. *Symmetrically indivisible and elementarily indivisible structures*, McMaster-Waterloo Model Theory Seminar, October 8, 2024.
7. *Isomorphism Spectra and Computably Composite Structures*, University of Waterloo Logic Seminar, March 13, 2024.

I have also spoken about other topics in logic at various seminars at the University of Waterloo.

Service

University of Waterloo Women in Math Directed Reading Program, Winter 2025

- I supervised two undergraduate students learning about infinite combinatorics. I developed the curriculum for the reading program, wrote course notes, planned weekly meetings, and assigned readings and exercises between meetings.

University of Waterloo Computability Theory Learning Seminar organizer, Fall 2025 - Present

McMaster-Waterloo Model Theory Learning Seminar, co-organizer Fall 2024 - Summer 2025

Teaching Experience

Lecturer, University of Waterloo

MATH 127: Calculus 1 for Sciences	Fall 2025

Teaching Assistant, University of Waterloo

PMATH 433/733: Model Theory	Winter 2025
PMATH 432/632: First Order Logic and Computability	Fall 2023, Fall 2024
PMATH 330: Introduction to Mathematical Logic	Fall 2022, Winter 2023, Summer 2023, Winter 2024
MATH 235: Linear Algebra II for Honours Mathematics	Fall 2023
MATH 136: Linear Algebra I for Honours Mathematics	Winter 2023
MATH 135: Algebra for Honours Mathematics	Fall 2022, Fall 2024

Teaching Assistant, University of Toronto

CSCC24: Principles of Programming Languages	Winter 2021, Winter 2022, Summer 2022
CSCC63: Computability and Computational Complexity	Winter 2022
CSCB63: Design and Analysis of Data Structures	Winter 2022
MATA67: Discrete Mathematics	Fall 2020, Fall 2021
MATA22: Linear Algebra I	Winter 2021
MATA36: Calculus II	Winter 2021
CSCA08: Introduction to Computer Science I	Fall 2019, Winter 2020, Fall 2020

Senior Instructor, Science Engagement Programs 2017-2021
York University

- Developed and taught math and computer science curriculum in-person and online to groups of students (grades 3 to 12).
- Planned and led trainings for other instructors about teaching math and computer science.
- Instructed and supervised large groups of students in a classroom setting.
- Taught a wide range of topics in math, computer science, biology, chemistry, and physics.

Other Work Experience

Software Developer, Pharmer Program Software 2020 - 2023

- Designed and developed a web-app.
- Implemented algorithms based on mathematical models.
- Used knowledge in Full Stack web development, SQL, and Javascript.
- Maintained the app and implemented features requested by customers.