Georgia Institute of Technology **Alex Burgin** alexander.burgin@gatech.edu

Education

Georgia Institute of Technology *August 2023-Present*
Doctor of Philosophy, Mathematics
Advisor: Michael Lacey

Duke University *August 2019 - May 2023*
Bachelor of Science, Mathematics, with Distinction
Honors Thesis: *The Schrödinger Maximal Function and Generalizations*
Advisor: Lillian Pierce

Budapest Semesters in Mathematics *May 2022 - August 2022*

Research Interests

I am broadly interested in number theory and harmonic analysis, with a focused interest in arithmetic combinatorics, ergodic Ramsey theory, and applications of discrete harmonic analysis to number-theoretic problems.

Preprints and Publications

(1) **An Elementary Proof of Landau's Prime Ideal Theorem and Associated Results**, *Research in Number Theory.* arXiv:2406.08565. 2025.

(2) (with S. Goldberg, T. Keleti, C. Macmahon, X. Wang) **Large Sets Avoiding Infinite Arithmetic/Geometric Progressions**, *Real Analysis Exchange.* arXiv:2210.09284. 2023.

Awards and Honors

Graduate Student Representative (elected), GT School of Math *2025-2026*
David Brown Fellowship Award, GT School of Math *April 2025*
Georgia Tech School of Math GAANN Fellow *November 2024*
Invited Speaker, AMS Fall 2024 Southeastern Sectional *August 2024*
Special session on discrete analysis and ergodic theory
Invited Speaker, Vanderbilt Computational Analysis Seminar *April 2024*
Talk entitled: "Orthogonality & Equidistribution of the Prime-Omega Function over Ideals in Number Fields"
Graduate Research Assistant (GRA), Georgia Tech Math *Spring 2024*
Supported by Michael Lacey, through NSF grant award # 2247254.
Graduation with Distinction in Mathematics, Duke University *2023*
President, Duke University Math Union (DUMU) *2022-2023*
Invited Speaker, Duke Math PhD learning seminar *2022*
Talk entitled: "What is the Riemann Zeta Function (an analytic approach)?"
Presenter, UIC Undergraduate Mathematics Symposium *2022*

Honorable Mention, Math Contest in Modeling *2022*
Top 20% of Putnam Participants *2019*

Undergraduate Research Projects

The Schrödinger Maximal Function and Generalizations (Lillian Pierce) *2022-2023*
Erdos Similarity Conjecture & Related Problems (Tamas Keleti) *2022*
Modular Forms with Application to the Partition Function (Heekyoung Hahn) *2021*

Mathematical Activities, Outreach, and Service

Graduate Student Representative, GT School of Math *2025-2026*
Directed Reading Program Mentor (Georgia Tech) *2023-Present*
President, Duke University Math Union (DUMU) *2022*

Conferences and Workshops

Perspectives on Ergodic Theory and its Interactions *June 2025*
Institute of Mathematics of the Polish Academy of Sciences
INTEGERS 2025 *May 2025*
University of Georgia
AMS Fall Southeastern Sectional Meeting (invited speaker; canceled) *October 2024*
Special session on Ergodic Theory and Discrete Analysis (Neil Lyall)
NU Trends in Ergodic Theory (workshop) *July 2024*
Northwestern University
Pointwise Ergodic Theory and Connections, II (invited) *June 2024*
University of Bristol (Ben Krause)