

ALEYAH DAWKINS

Department of Mathematical Sciences
Carnegie Mellon University
Pittsburgh, Pennsylvania 15213 USA

Email: adawkins@andrew.cmu.edu

EDUCATION EXPERIENCE

- | | |
|---|----------------------|
| NSF MPS-Ascend Postdoctoral Research Fellow , Carnegie Mellon University
Scientific Mentor: Michael Young | August 2024–Present |
| Ph.D. in Mathematics , George Mason University (GMU)
Advisors: Geir Agnarsson and Rachel Kirsch | August 2019–May 2024 |
| B.S. in Mathematics , James Madison University | August 2012–May 2016 |

INDUSTRY EXPERIENCE

- | | |
|---|---------------------------|
| Los Alamos National Laboratory , Los Alamos, New Mexico
Guest Student | August 2023–August 2024 |
| U.S. Census Bureau , Suitland, Maryland
Statistician | December 2016–August 2019 |

RESEARCH INTERESTS

Combinatorics extremal graph theory, graph labeling, Ramsey theory, design theory

PUBLICATIONS AND PREPRINTS

1. A. Dawkins and R. Kirsch. *Ore plus Turán* arXiv:2310.11452, Submitted, 2026.
2. A. Dawkins and R. Kirsch. *Maximizing the number of cliques in $Kr+1$ -free graphs with forbidden properties* arXiv:2609.25196, Submitted, 2026.
3. A. Cao, A. Dawkins, J. Hutchins, and O. Luce *Radio gracefulness of Moore graphs and beyond*, Australasian Journal of Combinatorics, 2026. arXiv:2510.00228
4. M. Bayer, S. Borgwardt, T. Chambers, S. Daugherty, A. Dawkins, D. Deligeorgaki, H. Liao, T. McAllister, A. Morrison, G. Nelson, and A. Vindas-Meléndez *Combinatorics of generalized parking-function polytopes*, Discrete & Computational Geometry, 2025. [arXiv:2403.07387]
5. A. Dawkins, V. Gupta, M. Kempton, W. Linz, J. Quail, H. Richman, Z. Stier. *A Ricci flow on graphs from effective resistance*, Journal of Combinatorics, 2025. [arXiv:2403.01151]
6. A. Dawkins, V. Gupta, M. Kempton, W. Linz, J. Quail, H. Richman, Z. Stier. *Node resistance curvature in Cartesian graph products*, Journal of Combinatorics, 2025. [arXiv:2403.01037]
7. K. Isham, L. Monroe, K. Lakhotia, A. Dawkins, D. Hwang, and A. Kubicek, *Edge-Disjoint Spanning Trees on Star-Product Networks*, 2025 IEEE International Parallel and Distributed Processing Symposium (IPDPS). [arXiv:2403.12231]
8. G. Agnarsson, E. Alhajjar, and A. Dawkins. *On locally finite ordered rooted trees and their rooted subtrees*, Discrete Applied Mathematics, 2025. [arXiv:2312.11379]
9. A. Dawkins, J. Elder, P. E. Harris, K. Harry, D. Smith, and B. E. Tenner. *On the Lucky and Displacement Statistics of Stirling Permutations*, Journal of Integer Sequences, 2024. [arXiv:2403.03280]

RESEARCH EXPERIENCE

Graduate Research Assistant

Advisor: Dr. Laura Monroe

Los Alamos National Laboratory

June 2023–August 2023

Topic: *Constructing edge-disjoint spanning trees in post-exascale networks*

Graduate Research Assistant

Advisor: Dr. Rachel Kirsch

George Mason University

August 2022–May 2023

Title: *Edge conditions for Hamiltonicity and related properties in K_{r+1} -free graphs*

Graduate Research Assistant

Industrial Immersion Program (IIP)

George Mason University

June 2022–August 2022

Advisors: Dr. Geir Agnarsson (GMU Math) and Dr. Elie Alhajjar (West Point Math)

Title: *On locally finite ordered rooted trees and their rooted subtrees*

Graduate Assistant Mentor

Mason Experimental Geometry Lab (MEGL)

George Mason University

January 2022–May 2022

Advisor: Dr. Ben Schweinhart and Dr. Erika Roldan

Title: *Random 3D Polyforms*

Graduate Research Assistant

Industrial Immersion Program (IIP)

George Mason University

May 2021–August 2021

Advisors: Dr. Maria Emelianenko (GMU Math), Dr. Ming Tian (GMU Physics), and Dr. Fred Wieland (Mosaic ATM)

Title: *Quantum algorithms for Unmanned Air Vehicles (UAV) trajectory optimization*

Graduate Research Assistant

NSF Improving Undergraduate STEM Education

George Mason University

August 2020–May 2021

Advisors: Dr. Robert Sachs and Dr. Jill Nelson

MENTORING

Undergraduate Research Advisor

Carnegie Mellon University

Summer Undergraduate Applied Mathematics Institute (3 students)

Summer 2026

Title: *Wild Edges in Edge-Colored Graphs*

Summer Undergraduate Applied Mathematics Institute (3 students)

Summer 2025

Title: *Radio Labelings and the Moore bound*

Graduate Assistant Mentor

Mason Experimental Geometry Lab (2 students)

George Mason University

January 2020–May 2020

Advisor: Dr. Neil Epstein

Title: *Content formulas in algebras derived from Grassmanians*

TEACHING EXPERIENCE

Instructor of Record

Carnegie Mellon University

21-102 - Exploring Modern Mathematics

Spring 2026

Instructor of Summer Academy

Carnegie Mellon University

Modern Mathematics (20 high school students)

Summer 2026

Introduction to Graph Theory (26 high school students)

Summer 2024

Exploring the Worlds of Geometry (10 high school students)

Summer 2024

Tartans Scholar Tutor

Carnegie Mellon University

Various classes: Calculus, Linear Algebra

Fall 2024 - Spring 2025

Instructor of Record

George Mason University

MATH 114 - Analytic Geometry and Calculus II	Summer 2022
MATH 114 - Analytic Geometry and Calculus II (2 courses)	Summer 2021
MATH 114 - Analytic Geometry and Calculus II	Summer 2020
MATH 108 - Introductory Calculus with Business Applications	Summer 2020

Graduate Learning Assistant

George Mason University

PhD Launchpad Program	Summer 2022
-----------------------	-------------

Graduate Teaching Assistant

George Mason University

Math Tutoring Center	January 2022–May 2022
MATH 113 - Analytic Geometry and Calculus I	August 2021–December 2021
MATH 114 - Analytic Geometry and Calculus II	January 2021–May 2021
MATH 114 - Analytic Geometry and Calculus II	August 2020–December 2020
MATH 113 - Analytic Geometry and Calculus I	January 2020–May 2020
MATH 113 - Analytic Geometry and Calculus I	August 2019–December 2019

FUNDING AND AWARDS

- National Science Foundation, Mathematical and Physical Sciences Ascending Postdoctoral Research Fellowship, PI: Aleyah Dawkins (\$300,000), 2024-27
- Dean's Graduate Award for Excellence in Research, GMU, 2023-24 (\$1250)
- Doctoral Research Scholars Assistantship, Office of Provost, GMU, 2023-24 (\$22,000)
- Graduate Research Excellence Award, Department of Mathematics, GMU, 2023 (\$1000)
- Dean's Award for Excellence in Service, GMU, 2022 (\$1250)
 - for contributions to improve Mason Experimental Geometry Lab outreach to the community
- TC Lim Award for Excellence in Teaching, Department of Mathematics, GMU, 2022 (\$1000)
- TC Lim Award for Excellence in Teaching, Department of Mathematics, GMU, 2021 (\$1000)

PRESENTATIONS

Invited Talks

- JMM special session on Extremal Combinatorics and Beyond, *Ramsey numbers with wild edges*, January 2027
- JMM special session on Recent Developments in Graph Labeling Problems, *Radio Graceful Labelings of Generalized Petersen and Moore Graphs*, January 2027
- JMM NAM Haynes-Granville-Browne Session, *Wild number for spanning trees in complete and bipartite graphs*, January 2027
- 57th Southeastern International Conference on Combinatorics, Graph Theory & Computing, March 2026
- Kansas Women in Math Symposium, *Graph homomorphisms and radio graceful graphs*, April 2025
- Iowa State Discrete Math Seminar, *Radio Graceful Labelings of Graphs*, March 2025
- OURFA²M², Crash Course on *Drawing Connections Through Graphs*, February 2025
- JMM special session on Graphs, Hypergraphs, and Extremal Combinatorics, *Hamiltonicity and related properties in K_{r+1} -free graphs*, January 2025
- University of Massachusetts - Amherst Discrete Math Seminar, *Hamiltonicity and related properties in K_{r+1} -free graphs*, May 2024
- AMS Spring Eastern Sectional Meeting special session on Fresh Researchers in Algebra, Combinatorics, and Topology (FRACtals), *Edge conditions for Hamiltonicity in K_{r+1} -free graphs*, April 2024

- JMM special session on Applications of Extremal Graph Theory to Network Design, *Constructing Spanning Trees in Post-Exascale Networks*, January 2024
- JMM special session on Extremal and Probabilistic Combinatorics, *Hamiltonicity and related properties in K_{r+1} -free graphs*, January 2024
- AMS Fall Southeastern Sectional Meeting special session on Extremal and Probabilistic Combinatorics, *Post-Exascale Network Design*, October 2023
- Graduate Online Combinatorics Colloquium, *Hamiltonicity and related properties in K_{r+1} -free graphs*, September 2023
- AMS Spring Southeastern Sectional Meeting special session on Recent trends in Structural and Extremal Graph Theory, *Edge conditions for Hamiltonicity and related properties in K_{r+1} -free graphs*, March 2023

Contributed Talks and Posters

- ACO Seminar, *Ramsey numbers with wild edges*, Carnegie Mellon University, December 2026
- GSP Seminar, *The radio number of Moore graphs, cages, and random graphs*, Carnegie Mellon University, November 2025
- NAM MATHfest, *Hamiltonicity and related properties in K_{r+1} -free graphs*, September 2023
- ACORN Workshop Poster Session, *Edge conditions for Hamiltonicity and related properties in K_{r+1} -free graphs*, March 2023
- Howard Mathematics Graduate Student Seminar, *Edge conditions for Hamiltonicity in K_{r+1} -free graphs*, February 2023
- XVIII Escuela de Verano en Matemáticas Discretas, *Edge conditions for Hamiltonicity in K_{r+1} -free graphs*, January 2023
- IIP Summer Symposium, *Cyber security models and attacks*, August 2022
- BRIDGES Workshop, *Cheeger constant of Cartesian products of Cayley graphs arising from generalized dihedral groups*, June 2022
- JMM, *Cheeger constant of Cartesian products of Cayley graphs arising from generalized dihedral groups*, April 2022
- IIP Summer Symposium, *Quantum algorithms for Unmanned Air Vehicles (UAV) trajectory optimization*, August 2021
- MEGL Symposium, *Content formulas in algebras derived from Grassmanians* (jointly with undergraduate students), May 2020

ORGANIZING

- AMS Fall Eastern Sectional Meeting 2025, Co-organizer for special session on “Combinatorics and Graph Theory: The Audience Counts”
- AMS Fall Western Sectional Meeting 2024, Co-organizer for special session on “Gender Equity in the Mathematical Sciences (GEMS) of Combinatorics”
- JMM 2024, Co-organizer for *AMS Special Session on Ricci Curvatures of Graphs and Applications to Data Science*

CONFERENCES AND WORKSHOPS

- BIRS Bridging Theoretical Discrete Math Advancements with Open Source Resource Development 2026
- Combinatorics at the Confluence 2026
- NAM MATHfest 2025
- PIMS-BIRS-UBCO GEMS of Optimization 2025
- AIM workshop on Graph Theory: structural properties, labelings, and connections to applications 2024
- Early Career Researchers in Combinatorics (ECRiC24) 2024 (hosted by International Centre for Mathematical Sciences)

- Graduate Research Workshop in Combinatorics (GRWC) 2023
- AMS Mathematics Research Communities (MRC) conference 2023: Ricci Curvatures of Graphs and Applications to Data Science
- Extremal Graphs arising from Designs and Configurations (hosted by Banff International Reserach Station)
- GEMS of Combinatorics 2023 (hosted by AIM)
- CIME: Mentoring for Equity 2023 (hosted by MSRI/SLMath)
- Modern Math Workshop 2022 (organized by MSRI/SLMath)
- MSRI - Random Graphs 2022 Summer Graduate School
- Building Relationships for an Inclusive and Diverse Group of Emerging Students (BRIDGES) Workshop 2022 (University of Utah)

PROFESSIONAL SERVICE AND OUTREACH

- CMU Math Club Colloquium on *Ramsey Theory: Generalizations and Variations*, September 2026
- Women Who Lead 2026, Pittsburgh Public Schools
- Pittsburgh Community Science Workshop
 - Volunteer: Fall 2024, Spring 2025
- Panel on “Graduate School”, MATHfest 2023
- Student Research Talks (StReeTs) Seminar (GMU)
 - Co-organizer: Fall 2021, Spring 2022, Fall 2022, Spring 2023
- Society for Industrial and Applied Mathematics (GMU Chapter)
 - Vice President: 2021-2023
- Mason Experimental Geometry Lab
 - Lab Co-manager: Fall 2021, Spring 2022
 - Graduate Outreach Assistant: Fall 2021, Spring 2022
 - Graduate Assistant Mentor: Spring 2020, Spring 2022
- Graduate and Professional Student Association (GAPSA) (GMU)
 - Mathematics Representative: 2021-2022
- Mathematics Outreach
 - Volunteer at East-John Youth Center: Summer 2021