

ALEYAH DAWKINS

Department of Mathematics
George Mason University
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EDUCATION EXPERIENCE

George Mason University (GMU), Fairfax, Virginia
Ph.D. in Mathematics
Advisors: Geir Agnarsson and Rachel Kirsch

August 2019–Present
Expected May 2024

James Madison University (JMU), Harrisonburg, Virginia
B.S. in Mathematics

August 2012–May 2016

INDUSTRY EXPERIENCE

Los Alamos National Laboratory, Los Alamos, New Mexico
Guest Student

August 2023–Present

U.S. Census Bureau, Suitland, Maryland
Statistician

December 2016–August 2019

RESEARCH INTERESTS

Combinatorics extremal graph theory, computational graph theory, network theory

PUBLICATIONS

Publications and Preprints

1. 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* arXiv:2403.07387, Submitted, 2024.
2. A. Dawkins, J. Elder, P. E. Harris, K. Harry, D. Smith, and B. E. Tenner. *On the Lucky and Displacement Statistics of Stirling Permutations* arXiv:2403.03280
3. A. Dawkins, V. Gupta, M. Kempton, W. Linz, J. Quail, H. Richman, Z. Stier. *A Ricci flow on graphs from effective resistance* arXiv:2403.01151
4. A. Dawkins, V. Gupta, M. Kempton, W. Linz, J. Quail, H. Richman, Z. Stier. *Node resistance curvature in Cartesian graph products* arXiv:2403.01037
5. A. Dawkins, K. Isham, A. Kubicek, K. Lakhotia, and L. Monroe. *Edge-Disjoint Spanning Trees on Star-Product Networks*, Submitted SPAA 2024.
6. G. Agnarsson, E. Alhajjar, and A. Dawkins. *On locally finite ordered rooted trees and their rooted subtrees* arXiv:2312.11379, Submitted, 2023.
7. A. Dawkins and R. Kirsch. *Hamiltonicity and related properties in K_{r+1} -free graphs* arXiv:2310.11452, 2023.

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) Advisors: Dr. Geir Agnarsson (GMU Math) and Dr. Elie Alhajjar (West Point Math) Title: <i>On locally finite ordered rooted trees and their rooted subtrees</i>	George Mason University June 2022–August 2022
Graduate Assistant Mentor Mason Experimental Geometry Lab (MEGL) Advisor: Dr. Ben Schweinhart and Dr. Erika Roldan Title: <i>Random 3D Polyforms</i>	George Mason University January 2022–May 2022
Graduate Research Assistant Industrial Immersion Program (IIP) Advisors: Dr. Maria Emelianenko (GMU Math), Dr. Ming Tian (GMU Physics), and Dr. Fred Wieland (Mosaic ATM) Title: <i>Quantum algorithms for Unmanned Air Vehicles (UAV) trajectory optimization</i>	George Mason University May 2021–August 2021
Graduate Research Assistant NSF Improving Undergraduate STEM Education (IUSE) project Advisors: Dr. Robert Sachs and Dr. Jill Nelson	George Mason University August 2020–May 2021
Graduate Assistant Mentor Mason Experimental Geometry Lab (MEGL) Advisor: Dr. Neil Epstein Title: <i>Content formulas in algebras derived from Grassmanians</i>	George Mason University January 2020–May 2020
Undergraduate Research Assistant Research Experience for Undergraduates (REU) Advisor: Dr. Cameron Franc Title: <i>Hypergeometric series and modular forms</i>	University of Michigan May 2015–August 2015
Undergraduate Research Assistant Research Experience for Undergraduates (REU) Advisor: Dr. Edwin O'Shea Title: <i>Realizations of secondary polytopes</i>	James Madison University May 2014–December 2014

TEACHING EXPERIENCE

Instructor of Record MATH 114 - Analytic Geometry and Calculus II MATH 114 - Analytic Geometry and Calculus II (2 courses) MATH 114 - Analytic Geometry and Calculus II MATH 108 - Introductory Calculus with Business Applications	George Mason University Summer 2022 Summer 2021 Summer 2020 Summer 2020
Graduate Learning Assistant (GLA) PhD Launchpad Program	George Mason University Summer 2022
Graduate Teaching Assistant (GTA) Math Tutoring Center MATH 113 - Analytic Geometry and Calculus I MATH 114 - Analytic Geometry and Calculus II MATH 114 - Analytic Geometry and Calculus II MATH 113 - Analytic Geometry and Calculus I MATH 113 - Analytic Geometry and Calculus I	George Mason University January 2022–May 2022 August 2021–December 2021 January 2021–May 2021 August 2020–December 2020 January 2020–May 2020 August 2019–December 2019

AWARDS AND ACHIEVEMENTS

- Doctoral Research Scholars Assistantship, Office of Provost, GMU, 2023-24 (\$22,000 stipend)
- 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)
- Outstanding Mathematical Research, Department of Mathematics, JMU, 2016
 - for research done on *Realizations of secondary polytopes*

PRESENTATIONS

Invited Talks

- 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 (GOCC), *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

- 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 Grassmannians* (jointly with undergraduate students), May 2020
- REU Seminar (UMich), *Hypergeometric series and modular forms*, July 2015
- Nebraska Conference for Undergraduate Women in Mathematics (NCUWM) Poster Session, *Realizations of secondary polytopes*, January 2015
- Shenandoah Undergraduate Mathematics and Statistics (SUMS) Conference, *Realizations of secondary polytopes*, October 2014

CONFERENCE/WORKSHOP ORGANIZATION AND PARTICIPATION

Conferences and Sessions Organized

- AMS Fall Western Sectional Meeting, 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*

Other Conferences and Workshops

- 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)
- International Congress of Mathematics (ICM) 2022

PROFESSIONAL SERVICE AND OUTREACH

- 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