ALEYAH DAWKINS

Department of Mathematics
George Mason University
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EDUCATION EXPERIENCE

George Mason University (GMU), Fairfax, Virginia — August 2019–Present
Ph.D. in Mathematics — Expected May 2024
Advisors: Geir Agnarsson and Rachel Kirsch

James Madison University (JMU), Harrisonburg, Virginia — August 2012–May 2016
B.S. in Mathematics

INDUSTRY EXPERIENCE

Los Alamos National Laboratory, Los Alamos, New Mexico — August 2023–Present
Guest Student

U.S. Census Bureau, Suitland, Maryland — December 2016–August 2019
Statistician

RESEARCH INTERESTS

Graph Theory extremal graph theory, computational graph theory, network theory

PUBLICATIONS

Preprints

1. A. Dawkins and R. Kirsch. *Hamiltonicity and related properties in K_{r+1}-free graphs*

In Preparation

1. A. Dawkins, K. Isham, and L. Monroe. *Constructing edge-disjoint spanning trees in post-exascale networks*

2. G. Agnarsson and A. Dawkins. *On locally finite ordered rooted trees and their rooted subtrees*

3. A. Dawkins, J. Elder, P. E. Harris, K. Harry, D. Smith, and B. E. Tenner. *Stirling permutations and the lucky statistic*

RESEARCH EXPERIENCE

Graduate Research Assistant — Los Alamos National Laboratory
Advisor: Dr. Laura Monroe — June 2023–August 2023

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

Graduate Research Assistant — George Mason University
Advisor: Dr. Rachel Kirsch — August 2022–May 2023

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

Graduate Research Assistant — George Mason University
Industrial Immersion Program (IIP) — 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 George Mason University
Mason Experimental Geometry Lab (MEGL) January 2022–May 2022

Advisor: Dr. Ben Schweinhart
Title: *Random 3D Polyforms*

Graduate Research Assistant George Mason University
Industrial Immersion Program (IIP) 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 George Mason University
NSF Improving Undergraduate STEM Education (IUSE) project August 2020–May 2021

Advisors: Dr. Robert Sachs and Dr. Jill Nelson

Graduate Assistant Mentor George Mason University
Mason Experimental Geometry Lab (MEGL) January 2020–May 2020

Advisor: Dr. Neil Epstein
Title: *Content formulas in algebras derived from Grassmanians*

Undergraduate Research Assistant University of Michigan
Research Experience for Undergraduates (REU) May 2015–August 2015

Advisor: Dr. Cameron Franc
Title: *Hypergeometric series and modular forms*

Undergraduate Research Assistant James Madison University
Research Experience for Undergraduates (REU) May 2014–December 2014

Advisor: Dr. Edwin O'Shea
Title: *Realizations of secondary polytopes*

TEACHING EXPERIENCE

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 (GLA) George Mason University

PhD Launchpad Program Summer 2022

Graduate Teaching Assistant (GTA) 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

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

- 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 Matématicas 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

- 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

- JMM 2024, Co-organizer for *AMS Special Session on Ricci Curvatures of Graphs and Applications to Data Science*

Other Conferences and Workshops

- Graduate Research Workshop in Combinatorics (GRWC) 2023
- AMS Mathematics Research Communities (MRC) conference 2023: Ricci Curvatures of Graphs and Applications to Data Science
- 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