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Research Interests

I am interested in algebraic, enumerative, and geometric combinatorics; in particular, I am interested in Ehrhart Theory, that is, lattice-point enumeration for rational and integral polytopes, and its applications.

Education

Washington University in St. Louis (WUSTL), St. Louis, MO, USA
    A.M., Mathematics, May 2021
    Ph.D., Mathematics, *In Progress; Projected Graduation Date:* May 2025
    Advisors: Laura Escobar & John Shareshian
San Francisco State University (SFSU), San Francisco, CA, USA
    M.A., Mathematics, May 2019
    Thesis: *Ehrhart Quasipolynomials of Coxeter Permutahedra*
    Advisors: Federico Ardila & Matthias Beck
Calvin University (formerly Calvin College), Grand Rapids, MI, USA
    B.S., Mathematics, May 2016

Honors and Awards

- WUSTL Dean's Award for Teaching Excellence Recipient, April 2023
- WUSTL Robert H. McDowell Teaching Award, May 2022
- SFSU Graduate Hood Recipient for the College of Science & Engineering, May 2019
- SFSU College of Science & Engineering Research Showcase Honorable Mention for Poster Presentation, May 2018
- Calvin College Dean's List, Fall 2012 – Spring 2016
- Calvin Christian High School Valedictorian, 2012
- National Merit Commended Student, 2012
- Harvard Prize Book Recipient, 2011

Scholarships and Grants

- Prepared and received NSF conference grant DMS-2245927 (PI: Martha Precup) for the Graduate Student Combinatorics Conference 2023. Co-written with a small group of other graduate students.
- Calvin Trustee Scholarship, Fall 2012 - Spring 2016

Publications

- F. Ardila, M. Beck, and J. McWhirter, The arithmetic of Coxeter permutahedra, *Revista de la Academia Colombiana de Ciencias Exactas, Físicas y Naturales* **44**,

no. 173 (2020), 1152-1166.

Papers in Preparation

- L. Escobar and J. McWhirter, Oriented matroid circuit polytopes
- J. Gallegos, J. McWhirter, and G. Santellano, Domino tilings of the United Farm Workers' symbol

Research Talks

- September 2023 - Graduate Online Combinatorics Colloquium (Invited)
- May 2023 - Spectra Survey of Mathematics
- June 2022 - Encuentro Colombiano de Combinatoria
- March 2022 - Graduate Student Combinatorics Conference
- May 2021 - Talking About Combinatorial Objects Student Seminar (UC Berkeley)
- April 2021 - Graduate Student Combinatorics Conference
- March 2021 - Szego Seminar (WUSTL)
- February 2021 - Graduate Online Combinatorics Colloquium (Invited)
- October 2020 - Hypatian Seminar (Invited; UC Santa Barbara)
- May 2020 - Combinatorics Seminar (WUSTL)
- May 2019 - Mathematistas Student Research Seminar (SFSU)
- February 2018 - Mathematistas Student Research Seminar (SFSU)

Research Poster Presentations

- April 2023 - ALGECOM-XXIII: Algebra, Geometry, and Combinatorics Day
- October 2022 - ALGECOM-XXII: Algebra, Geometry, and Combinatorics Day
- June 2022 - An Algebraic Combinatorics Virtual Expedition
- May 2022 - A Graduate Meeting on Combinatorial Commutative Algebra
- September 2019 - ALGECOM-XVIII: Algebra, Geometry, and Combinatorics Day
- May 2019 - College of Science & Engineering Research Showcase (SFSU)
- April 2019 - Graduate Research and Creative Works Showcase (SFSU)
- February 2019 - MAA Golden Section Meeting
- May 2018 - College of Science & Engineering Research Showcase (SFSU)
- April 2018 Graduate Research and Creative Works Showcase (SFSU)

Conference and Seminar Organization

- Graduate Student Combinatorics Conference (GSCC) 2023 co-organizer, spring 2023
- WUSTL Combinatorics Seminar, fall 2022 - spring 2023
- Mathematistas Student Research Seminar founder and organizer, spring 2018 - spring 2019

Conferences and Workshops Attended

- FPSAC: Formal Power Series and Algebraic Combinatorics. July 2023

- AlCoVE: An Algebraic Combinatorics Virtual Expedition. June 2023
- Spectra Survey of Mathematics. May 2023
- ALGECOM-XXIII: Algebra, Geometry, and Combinatorics Day. April 2023
- Graduate Student Combinatorics Conference (GSCC) 2023. March 2023
- ALGECOM-XXII. October 2022
- Encuentro Colombiano de Combinatoria (ECCO) 2022. June 2022
- AlCoVE 2022. June 2022
- Open Problems in Algebraic Combinatorics (OPAC). May 2022
- A Graduate Meeting on Combinatorial Commutative Algebra (GradMoCCA). May 2022
- GSCC 2022. March 2022
- Cascade Lectures in Combinatorics (CALICO). November 2021
- GEMS of Combinatorics. September 2021
- AlCoVE 2021. June 2021
- Diversity and Excellence Workshop: Women in Combinatorics and Representation Theory. May 2021
- AMS Spring Western Sectional Meeting. May 2021.
- GSCC 2021. April 2021.
- ICERM Algebraic Geometry and Polyhedra Workshop. April 2021.
- Bay Area Discrete (B.A.D.) Math Day. April 2021.
- ALGECOM-XXI. April 2021
- (Polytop)ics: Recent advances on polytopes. April 2021
- Research Encounters in Algebraic and Combinatorial Topics (REACT), February-March 2021
- ALGECOM-XX. December 2020
- FPSAC 2020 Online. July 2020
- AlCoVE 2020. June 2020
- SACNAS 2019: The National Diversity in STEM Conference. October-November 2019
- ALGECOM-XVIII. September 2019
- B.A.D. Math Day. April 2019
- MAA Golden Section Meeting. February 2019
- AMS Fall Western Sectional Meeting. October 2018
- Western Algebraic Geometry Symposium (WAGS). March 2018
- SACNAS 2017: The National Diversity in STEM Conference. October 2017
- B.A.D. Math Day. April 2017

Teaching and Mentoring

- Assistant to the Instructor, WUSTL, Department of Mathematics. Fall 2020 - current

  The responsibilities of an Assistant to the Instructor include helping students understand material presented in lecture, presenting lectures, grading, writing questions for quizzes and tests, and proctoring quizzes and tests.

– Math 1011: Introduction to Statistics (Spring 2022)
– Math 131: Calculus I (Spring 2021, Fall 2021, Fall 2022)
– Math 132: Calculus II (Spring 2023)
– Math 233: Calculus III (Fall 2020)

- Instructor of Record for Math 1011: Introduction to Statistics, WUSTL, Department of Mathematics. Summer 2023.

- Discussion group leader for the WUSTL Graduate Student Mentored Teaching Orientation. August 2022

- Directed Reading Program Mentor, WUSTL, Department of Mathematics. Spring 2021 - Fall 2022

  I co-lead a directed reading program with Nathan Lesnevich in which we help undergraduate and postbaccalaureate students learn graduate-level math.

  – Young Tableaux (Spring 2021)
  – Introduction to Ehrhart Theory (Fall 2021)
  – Lie Algebras (Spring 2022)
  – Introduction to Matroids (Fall 2022)

  I led a discussion section for first-time Assistants to the Instructor in the WUSTL Department of Mathematics and Statistics.

- Graduate Teaching Associate, SFSU, Department of Mathematics. Fall 2016 - May 2019

  Worked in two roles, Primary Instructor and Teaching Assistant. The Math 70 courses in Fall 2017 were also a part of the Metro College Success Program, which works to help low income, first generation, and historically underrepresented college students succeed at the university.

  – Math 60: Entry Level Math I, Primary Instructor (Fall 2016)
  – Math 70: Entry Level Math II, Primary Instructor (Spring 2017, Fall 2017)
  – ESM 60: Entry Level Math I, Primary Instructor (Summer 2017)
  – Math 198: Prelude to Calculus II, Primary Instructor (Spring 2019)
  – Math 199: Pre-Calculus, Primary Instructor (Fall 2018)
  – Math 226: Calculus I (Seminar), Teaching Assistant (Fall 2016, Spring 2017, Spring 2018)
  – Math 227: Calculus II (Seminar), Teaching Assistant (Fall 2018)

- Grader for Math 420/720: Combinatorics, SFSU, Department of Mathematics. Spring 2018

- Tutor, Calvin College, Academic Services. Fall 2013 - May 2016

  Employed by the college in two roles, Calc Help Tutor and Individual Tutor.

- Calc Help Tutor (Fall 2013, Spring 2014, Fall 2014, Fall 2015, Spring 2016)
- Math 171: Calculus I, Individual Tutor (Fall 2013)
- Math 172: Calculus II, Individual Tutor (Spring 2014)
- ASC 004: Mathematics for the Liberal Arts Student, Individual Tutor (Fall 2014)
- Math 256: Discrete Structures and Linear Algebra, Individual Tutor (Spring 2016)

Community Engagement

- Mathematistas at SFSU

  Mathematistas at SFSU is a student group of mathematicians and math lovers who support and build towards gender equity in pursuit of mathematics. It is a social and academic club designed to create a network that will help its members succeed as students and will be there for them as they progress in the field. In addition, it sponsors events to engage others in mathematics and showcase the work of under-represented mathematicians.

  - Alumna Member, May 2019 - current
  - Student Member, September 2016 - May 2019
  - Officer, September 2017 - August 2018
  - Student-to-Student Advising Panel Event Coordinator and Assistant Moderator (Fall 2017, Spring 2018)
  - Student Research Seminar Coordinator (Spring 2018 - Spring 2019)

- Graduate Students in Combinatorics Discord Server Co-Founder and Administrator

  Discord is a persistent chat forum that has become increasingly popular; the Graduate Students in Combinatorics Discord server was created as a space for graduate students in Combinatorics to connect at conferences, stay connected after, and advertise opportunities to each other. We currently have over 150 members.

Affiliations

- Mathematistas at SFSU
- Society for the Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS)
- American Mathematical Society (AMS)

Skills

- Languages: English (native), Spanish (some)
- Fluent in the computer algebra system SAGE
- Fluent in LaTeX, including BEAMER