

Curriculum Vitae, Sterling Saint Rain

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Education:

Purdue University (GPA: 3.96)

- B.S. Mathematics Honors (Expected May 2023)

Research Experience:

University of Minnesota, *Student Researcher* (June-August 2022)

Worked with Dr. Ayah Almousa and two peer students to establish novel results regarding a combinatorial characterization of polarizations of strongly stable ideals. The project culminated in a presentation and final report (in preparation for publication).

- Selected to be “project wrangler”: organized project meetings, followed up on assignments with group members, and presented project updates to the wider program

Sandia National Labs, *Student Researcher* (Fall 2020)

Developed and implemented metrics for analyzing Chess game data sets using Python and R to determine a categorization method of player types with the aim of developing a data science toolkit for determining optimal strategies in a variety of wargame simulations relevant to national security.

Directed Study in Commutative Algebra *Faculty guide: Uli Walther* (February 2021- May 2022)

Organized weekly meetings with Purdue Mathematics professor Dr. Uli Walther to establish a background in commutative algebra techniques and survey research practices.

- In the Spring of 2021 and Fall of 2021, studied Ezra Miller’s survey: “Topological Cohen–Macaulay criteria for monomial ideals” and associated materials
- In the Spring of 2022, worked together with a fourth-year graduate student through exercises in the compiled notes “Twenty-Four Hours of Local Cohomology”

Talks, Presentations, and Conferences:

Joint Mathematics Meeting 2023 *Speaker – Invited Talk: Special Session in Combinatorial Techniques in Commutative Algebra* (January 2023)

- To present our research on polarizations of strongly stable ideals with Hanson Hao (Stanford University) and Yuyuan Luo (Massachusetts Institute of Technology)

University of Illinois – Chicago Undergraduate Mathematics Symposium *Poster Presenter* (November 2022)

Purdue Undergraduate STEM Symposium *Selected Speaker* (September 2022)

Algebra, Geometry and Combinatorics Day (AlGeCom) *Attendee* (October 2022)

Association for Women in Mathematics Research Symposium *Attendee* (June 2022)

Service and Mentoring:

Purdue Honors College Mentor Program (August 2020 – December 2022)

Co-President (December 2021 – December 2022)

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- Led a program of 146 honors mentors for over 1000 first year honors students, established and pursued a vision statement for the 2022 cohort, worked with Honors Student Diversity Officers to develop and lead a two-day diversity and belonging workshop, worked with other honors college programs to create joint initiatives and partner program events, and wrote weekly executive addresses to the program cohort

Council (December 2020 - December 2021)

- Organized bi-weekly events and outreach opportunities for mentors in the program to engage in the honors community and develop their leadership skills
- Led a team of eight mentors, guiding them in intentional reflection and personal development

Mentor (August-December 2020-2022)

- Facilitated weekly group recitations, helped foster positive group norms, and ensured my students' transition into college was successful and fulfilling through individual mentoring.

Purdue Commutative Algebra Student Seminar (Co-Organizer, January 2023 – Ongoing)

Extracurriculars:

Purdue Mathematics Anti-Racism Reading Group (Fall 2021- Spring 2022)

- Read articles and papers each week concerning the intersection between mathematics and diversity, inclusion, and belonging work, then met with graduate students in the mathematics department to discuss these readings and identify strategies for putting concepts to practice in our teaching and mentoring work

Purdue Honors College Conversations on Equity, Inclusion, and Belonging Series (attendee Fall 2022)

Purdue Commutative Algebra Seminar (attendee Fall 2020 – Ongoing)

Commutative and Homological Algebra Market Presentations (attendee for select talks Spring 2021 - Spring 2022)

Fellowship of the Ring Commutative Algebra Seminar (attendee for select talks Spring 2021 - Spring 2022)

Scholarships and awards:

Purdue College of Science Outstanding Junior in Mathematics Award (4/20/2022)

- Awarded to the top Purdue Mathematics Junior according to mathematical promise, achievement, and community engagement

Joel Spira Research Award (4/23/2021)

- Awarded to promising Purdue undergraduate researchers in STEM

Indiana Colligate Math Contest 1st Place Team (3/22/2021)

- With Chiara Travesset (Purdue University) and Ethan Brady (Purdue University)

Purdue Mathematics department Outstanding Freshman Award (4/20/2020)

Arthur Rosenthal Scholarship (4/23/2021, 4/20/2022)

Andris A. Zoltners Scholarship (4/20/2020)

Gerald R. MacLane Outstanding Student in Mathematics Scholarship (4/20/2020)