Ea E T

(403) 554 4168 | e.ea@ucalgary.ca | linkedin | Website

Education

University of Illinois Urbana-Champaign Calgary, AB
Doctor of Philosophy, Mathematics *Aug 2024 – May 2029*

University of Calgary Calgary, AB
Bachelor of Science, Honours Mathematics *Sept 2019 – Apr 2024*
GPA: 4.0/4.0

University of Calgary Calgary, AB
Bachelor of Science, Honours Physics *Sept 2019 – Apr 2024*
GPA: 4.0/4.0

Academic Achievements

Canadian Graduate Scholarship - Master's, Dalhousie University,
National Sciences and Engineering Research Council of Canada ($27 000) (2024)
Declined

Adam Richard Leinweber Memorial Scholarship, University of Calgary ($10 000) (2023)
Awarded based on academic merit and extra-curricular activities in the department of Physics.

Louise McKinney Scholarship, Alberta Government ($2500) (2022, 2023)
Awarded based on academic merit for a minimum of 8 courses taken at the UofC over the previous fall and winter terms.

Undergraduate Student Research Award, NSERC ($6000) (2022, 2023)

Program for Undergraduate Research Experience Award, University of Calgary ($7500),
Declined (2022)

Arthur Thomas Evans Scholar, University of Calgary ($2600) (2022)
Awarded to two students annually in the Faculty of Science based on academic merit.

R.J. Torrence Memorial Scholarship, University of Calgary ($1400, $1500) (2021, 2022)
Awarded to one student annually in the Department of Mathematics based on academic merit.

Dr. David John Fry Scholarship in Physics and Astronomy, University of Calgary ($2400) (2021)
Awarded to one student annually in the Department of Physics and Astronomy based on academic merit.

Jason Lang Scholarship, Alberta Government ($1000) (2021)
Awarded annually to undergraduate students who achieved a minimum GPA of 3.20 over at least 8 courses in the previous fall and winter terms.

Faculty of Science Dean's List, University of Calgary (2020-2023)

President's Admission Scholarship Recipient, University of Calgary ($5000) (2019)
Offered to first year undergraduate students with a high-school grade average of 95.0% or higher.

Evelyn Mitchell Emerson Entrance Bursary Recipient, University of Calgary ($6500) (2019)
Offered to two first year students based on academic merit in high-school.

Alexander Rutherford Scholarships Recipient, Alberta Government ($2500) (2019)

The Governor General's Academic Bronze Medal Recipient, Alberta Government (2019)
Awarded to the student with the highest graduating average from a Canadian high-school.

Projects and Research Experience

Honours Mathematics Thesis | University of Calgary (Jan 2024 – Apr 2024)

"Extending Universal Properties for Chain Complex Polynomial Functors" (Supervisor: Kristine Bauer)
Throughout this project I am working on extending results and constructions in abelian functor calculus to higher categorical settings. In abelian functor calculus functors between abelian categories are approximated in analogy with Taylor series approximations in differential calculus. This analogy is made explicit through the introduction of tangent categories which categorify differential methods.

Honours Physics Thesis | University of Calgary (Sept 2023 – Apr 2024)

"Resource Theories for Random Discrete Dynamical Systems" (Supervisor: Carlo Maria Scandolo)
In this project I utilize resource theories to classify the evolution of random discrete dynamical systems (RDDSs) subject to external influences which act on extended time scales. During the project I aim to examine constraints on such stochastic influences and form classifications for which influences can act on an RDDS with a specified graph of dynamics. This project extends work by Dr. Scandolo and his collaborators which utilized the framework of resource theories to completely determine possible state transitions for deterministic dynamical systems under extended time scale influences.

Research Assistant | University of Calgary (May – Aug 2023)

"Determining edges from distances of segments tangent to a circle" (Supervisor: Tracey Balehowsky)
In this project I researched an edge detection problem which involved determining the boundary of a two-dimensional region from tangent lengths to an interior bounded circle. Techniques from Functional Analysis, Distribution Theory, and Integral Geometry were utilized to analyze the initial data, form hypotheses on the minimal requirements for reconstruction, and analyze the geometry of the boundary.

Student Researcher | University of Calgary (Nov 2022 – Apr 2023)

"p-Atlas VXML Project via the Pacific Institute of Mathematical Sciences" (Supervisor: Clifton Cunningham)
Working with members of the Voganish Project group at the University of Calgary, I constructed algorithms for the sake of computing geometric multiplicity tables in the Langlands program. This work was an extension of the "Algorithms for multiplicity matrices in local representation theory" NSERC Summer Student position, with an emphasis on constructing a program similar to the Atlas used in the classification of the representations of real reductive groups, but instead for p-adic groups.

Research Assistant | University of Calgary (May – Aug 2022)

"Algorithms for multiplicity matrices in local representation theory" (Supervisor: Clifton Cunningham)
In this project I researched the p-adic analogue of the Kahzdan-Lusztig Hypothesis with the Voganish group as a summer research student at the University of Calgary. I created algorithms for computations of geometric and representation theoretic objects on both sides of the hypothesis for use by group members in the Macaulay2, Sage, and Python languages. The results of the research were presented at the Society of Undergraduate Mathematics Calgary's undergraduate student summer seminar, and resulted in a first place prize for the presentation section. The research was also later presented at the Canadian Mathematical Society 2023 Summer Meeting.

Talks and Posters

PIMS Algebraic Geometry Course, (lecture) PIMS (2024)
Canadian Mathematical Society Summer Meeting, (presentation) University of Ottawa (2023)
PIMS Virtual Experimental Math Lab, (presentation and poster) (2023)
SUM-C Summer Seminar, (presentation) University of Calgary (2023)
SUM-C Summer Seminar, (presentation) University of Calgary (2022)
SUM-C Summer Seminar, (presentation) University of Calgary (2021)

Professional Experience

Physics and Astronomy Students' Association (PASA) |
University of Calgary Vice President Academic (May 2022 – Apr 2024)
I conducted academic workshops and events including graduate school seminars, LaTeX workshops for first and second year students, and research night events where professors in the Physics and Astronomy Department presented on their work and summer student research opportunities. I also hosted weekly tutorial nights for undergraduate students looking for extra assistance with their courses.

PHAS Equity, Diversity, Inclusion (EDI) Committee |
University of Calgary (Oct 2021 – Jun 2024)
I participate in the UofC PHAS EDI committee, which is a group focused on the implementation of Physics and Astronomy based initiatives for the sake of increasing accessibility and improving department culture.

Teaching Experience

Teaching Assistant - Math 275: Calculus for engineers and scientists (Sept 2023 – Dec 2023)
I assisted students in large group worksheet sessions and smaller scale math help sessions. I also graded weekly worksheets and invigilated midterm and final exams.

Physics and Math Tutor | Independent (Sept 2019 – date)
I provided regular one-on-one and one-on-many tutoring for first and second year undergraduate physics and mathematics courses at the University of Calgary.

Outreach Experience

Physics and Astronomy Mentor Talks | University of Calgary (Jan 2022 – date)
The Physics and Astronomy Mentor (PAM) Talks is a web series on women and gender minorities in physics started in 2022. I have participated both in the workshopping and recording video and podcast episodes for the webseries, as well as the promotion of the webseries as a whole.

Girls Excel in Math Summer Camp | University of Calgary (2023)
I volunteered in supporting a group of grade 6-9 students who identify as girls work through problems in graph theory, problems in game theory, exercises with fractals, and geometric exercises with origami.

Mentor | University of Calgary, PASA (Sept 2021 – May 2024)
I participated as a mentor for two first and second year physics students from 2021-2023, as well as a two additional physics students from 2023-2024. I assisted all students with course work, degree planning, and getting involved in summer research opportunities.

Education Development Experience

Undergraduate Liason Comittee | University of Calgary (Apr 2022 – Apr 2024)
I work with faculty members and peers to improve course structure in the Physics and Astronomy department, and implement new policies intended to assist with greater student learning and mental health.

Undergraduate Affairs Committee | University of Calgary (Apr 2022 – Apr 2024)
I actively participate in curriculum development for the Physics and Astronomy undergraduate program, helping to identify areas which are in need of extra support or restructuring so as to best serve the needs of undergraduate students.

Academic Affiliations

Kristine Bauer Research Group (Sept 2023 – date)
Voganish Project Group Member (May 2022 – Apr 2023)