Emily Carver CV in the works

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Education

B.Sc. Physics September 2022 - Present
University of Lethbridge, Lethbridge, AB 3.95/4.00 GPA

Research Experience

Co-op Work Term: Radio Astronomy Researcher May 2025 - August 2025
National Research Council Canada, Victoria, BC

Visibility Modelling of Galactic Star-Forming Regions at Millimetre Wavelengths
Supervisors: Dr. Doug Johnstone, Dr. Toby Brown

- Will elaborate after I know exactly what I'm doing, and when I have achievements to share.
- Leveraged existing visibility modelling tools and techniques from the field of protoplanetary disk studies to prove (demonstrate?) the

Astrophysics Research Assistant January 2024 - August 2024
University of Lethbridge, Lethbridge, AB

Investigating the Evolution of Black Hole Jets at Millimetre Wavelengths
Supervisor: Dr. Alexandra Tetarenko

- Analyzed data from the Atacama Large (Sub-)Millimetre Array (ALMA) using the python-based program `CASA` to investigate time and frequency-based variations in the flux of Black Hole X-ray Binaries GX 339-4 and GRS 1915+105.
- Produced a written report[1] of my findings, including image products and the process by which they were created. The complete set of products is available on Github[2].
- Funded by the highly competitive ULethbridge Chinook Summer Research Award.
- Results of this project will be used in a theoretical modelling effort by international colleagues and will be included in a future publication that I will co-author.

Publications

[1] put co-authored paper here

Research Presentations

Oral Presentations

*Canadian Conference for Undergraduate Women and Gender Minorities in Physics (CCUW*iP)* February 1, 2025

- Won second place for my presentation of my research project "*Investigating the Evolution of Black Hole Jets at Millimetre Wavelengths*" at CCUW*IP 2025 hosted by the University of Calgary and University of Alberta
- CCUW*iP is a yearly national conference for undergraduate physics and engineering physics students who are members of equity deserving groups.

Poster Presentations

Astrophysics Undergraduate Research Mini-Symposium September 27, 2024

- Presented my research project "*Investigating the Evolution of Black Hole Jets at Millimetre Wavelengths*" and accompanying poster[3] to faculty and students in the Department of Physics and Astronomy, as well as university community members from the wider Faculty of Arts and Science.

University of Lethbridge Summer Research Showcase August 15, 2024

[1] The report can be viewed here. [2] My Github account. [3] The poster can be viewed here.

- Presented my research project and accompanying poster[3] to members of the public, fellow undergraduate researchers, and their supervisors.

Professional Experience

Undergraduate Research Advocate October 2024 - Present

- Developed and currently leading a program to strengthen communication on undergraduate research opportunities at the University of Lethbridge, and ensure students specifically in Physics and Astronomy are informed of opportunities available to them.

Department of Physics and Astronomy Student Representative July 2024 - Present

- Chosen by the Physics and Astronomy department head to act as student representative for the 2024/2025 and 2025/2026 academic years.

High School Physics Tutor December 2024 - January 2025

Scholarships and Awards

I have received the **Dean's Honour List Award** each of my six completed semesters at ULethbridge. I was also selected as a 2024/2025 **ULethbridge Shining Student**[4], which recognizes exceptional students at the University of Lethbridge for their academic achievements and community involvement.

Further, I have received numerous merit-based scholarships totalling more than **$18 500 CAD** over the last four years.

Alberta Women in STEM Scholarship ($2500 CAD)	2025
Jason Lang Scholarship ($1000 CAD)	2024
Dickinson Memorial Scholarship ($1850 CAD)	2024
Chinook Summer Research Award ($6000 CAD)	2024
University of Lethbridge Scholarship ($1300 CAD)	2023
Jason Lang Scholarship ($1000 CAD)	2023
University of Lethbridge Achievement Scholarship ($1500 CAD)	2022
Board of Governors Admission Scholarship ($1000 CAD)	2022
Government of Alberta Rutherford Scholarship ($2500 CAD)	2022
NSERC Undergraduate Student Research Award ($8730 CAD awarded, declined)	2025
Chinook Summer Research Award ($6000 CAD awarded, declined)	2025

Outreach

University of Lethbridge Observatory October 2024 - Present

- Team member of an ongoing project to create an observatory at the University of Lethbridge campus, which may be used for both public outreach and hands-on learning in undergraduate classes.
- Contributed to a project proposal that exceeded initial funding goals.

Astronomy Observing Field Trip Volunteer November 7, 2024

- Assisted in running the ASTR2020 - Modern Astronomy observing field trip, hosted by Dr. Alex Tetarenko and the Lethbridge Astronomy Society.
- Activities included a virtual astrophotography experience, on-site observation of various planets and star clusters, and a planetarium tour.

University of Lethbridge Open House Volunteer October 26, 2024

- Spoke with prospective students and their families about University of Lethbridge, highlighting experiences in physics and undergraduate research.

Shad Canada Lab Assistant July 15, 2024

[4] My interview can be read here.

- Shad Canada is a science and entrepreneurship program for high school students, hosted at Canadian universities over the summer months.
- During Shad Canada 2024 at the University of Lethbridge, assisted in a circuitry lab to introduce high school participants to experimental physics at a post-secondary level.
- Answered student questions on math and circuit theory, and guided construction of a simple filter and amplifier circuit.

Other Skills

Astronomical Data Analysis: Skilled user of `CASA` for astronomical data analysis and `CARTA` for image visualization and analysis. I have worked specifically with interferometric data from ALMA in frequency bands 3, 4, and 6, as well as data from MAXI. Additionally, I have experience in the creation of publication-quality images and figures, which can be viewed on my linked poster or research report.

Programming: Proficient python programmer, with experience utilizing *Matplotlib*, *Astropy*, and *Scipy* packages. Experience with programming in C++. Extensive experience in LaTeX document preparation, with skills in creating both formal and informal reports.

Tech Skills: Proficient knowledge of Linux, Macintosh, and Windows operating systems. Experience with the implementation and use of cloud computing for astronomy research, specifically Cybera. Competent user of Git and Github.

Leadership: I have taken on leadership roles, both in and outside of academic settings. By proposing a project to increase undergraduate student awareness of research opportunities, I have helped mobilize multiple students and faculty. Outside of the university setting, I have been a leader in the high stress role of a lifeguard, creating a culture of support, safety, and organization between colleagues. Additionally, I worked as a coach for a summer swim club, where I learned methods to effectively communicate to swimmers of different age, ability, and background.

Academic Progress

I am currently a third year student, with a cumulative 3.95/4.00 GPA. Additionally, I have taken many relevant courses across multiple sciences.

Physics	**Mathematics**	**Other**
Introduction to Physics I, II, III	Accelerated Calculus I	Modern Astronomy
Waves, Optics, and Sound	Accelerated Calculus II	Introduction to Cosmology
Introduction to Experimental Physics	Accelerated Calculus III	Fundamentals of Programming I
Mathematical Physics	Elementary Linear Algebra	General Chemistry I
Intermediate Experimental Physics	Differential Equations I	Cellular Basis of Life
Classical Mechanics		
Theoretical Methods in Physics		
Quantum Mechanics I, II, III		
Introduction to Quantum Computing		
Nuclear and Particle Physics		* – In Progress