Evan Davies-Velie

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Summary

During my undergraduate studies at McGill University, I developed a passion for research in astrophysics, specializing in radio astronomy. Engaging in the Canadian Hydrogen Intensity Mapping Experiment (CHIME), I led point source analysis, creating automated pipelines for blazar variability studies. Proficient in Python, I implemented custom algorithms and delved into low-level data work on the Canadian Hydrogen Observatory and Radio-transient Detector (CHORD). Beyond research, I contributed to teaching as a TA for mathematics courses. This academic journey has solidified my commitment to pursuing advanced studies in astrophysics, leveraging my skills in data analysis and instrumentation.

Education

McGill University *2020-2024*

B.Sc in Joint Honours Physics and Computer Science

- Fourth-year honours student at McGill studying physics and computer science.

Carson Graham Secondary School *2015-2020*

International Baccalaureate Diploma Programme (IBDP)

- Completed the IBDP with my Higher Level courses in Physics, Chemistry, and English.

Experience

Research Assistant, Canadian Hydrogen Intensity Mapping Experiment (CHIME)

2023-present / McGill

Supervisors: Matt Dobbs and Dallas Wulf

- Led point source analysis on a large catalog of blazars, focusing on developing an automated pipeline for detecting variability signatures, specifically quasi-periodic oscillations (QPOs).

- Utilized CHIME's unique observational capabilities to study short-term variations, offering insights into the structure, dynamics, and emission mechanisms of Active Galactic Nuclei (AGN).

- Implemented Lomb-Scargle Periodogram and Weighted Wavelet Z-Transform from scratch, showcasing proficiency in Python programming.

- Employed Monte Carlo techniques to quantify the significance of dominant periods, assuming blazar light curves could be modeled by autoregressive processes.

- Demonstrated adaptability by self-learning parallelization for use on large compute clusters, enabling the efficient processing of the entire blazar catalog.

- Currently co-authoring a paper on blazar analysis with Dallas Wulf.

Research Assistant, Canadian Hydrogen Observatory and Radio-transient Detector (CHORD)

2023-present / McGill

Supervisors: Matt Dobbs and Dallas Wulf

- Transitioned to low-level data and instrumentation work, contributing to CHORD by analyzing system temperature data for the Deep Dish Development Array (D3A).

- Gained insights into radio telescope operation and data storage, enhancing proficiency in both instrumentation and analysis tasks.

- Developed a comprehensive understanding of the Deep Dish Development Array, laying a foundation for future work in instrumentation and data analysis.

Teaching Assistant

2022-present / McGill

Professor: Charles Roth

• Over the last 4 semesters I have been a teaching assistant for Professor Charles Roth for various courses. These courses include, MATH 314 Advanced Calculus, MATH 315 Ordinary Differential Equations, MATH 262 Intermediate Calculus for Engineers, and MATH 264 Advanced Calculus for Engineers. For these classes, I held weekly tutorials, invigilated exams, and assisted students with course material over email.

Lunch with a Scientist Initiative

2019-2020 / Vancouver

Co-Founder

• During high school, my friend and I founded a speaker series in which we invited a wide range of scientists to come into our school and talk to students about their careers, and the path that led them there. Speakers ranged anywhere from UBC professors, to forensic scientists, environmental scientists, and many more. The goal of this initiative was to make more students passionate about science and possibly even push them to pursue science in post-secondary.

Skills

Programming Languages	Python | C | Java | Bash | Matlab
Frameworks & Libraries	Astropy | | SciPy | Matplotplib | Numpy | emcee
Other	Git | Parallelization

Volunteering

- At my high school, I participated in several dinner initiatives in which we converted our school cafeteria into a restaurant for the homeless. During these events, I worked in any position I was needed for, but primarily worked in the front of the house so I could engage with our guests.
- Also, at my high school, I participated in a Sleep-Out fundraiser for homeless youths in Vancouver. My fellow participants and I raised over $10,000 for our cause. This is an important cause to me because a large percentage of homeless youth in Vancouver are queer and have been kicked out of their house for being who they are . Coming from a queer household, I am lucky to be accepted by my parents, so the aspect of others not receiving this privilege is heartbreaking.
- In 2019 I helped plan a ”Relay for Life” at my high school. This is a fundraiser for the Canadian Cancer Society. My team and I managed to raise over $20,000 for the CCS.