

Wasi M.F. Naqvi

[🌐 Wasi Naqvi](#) | [📧 wasnaqvi](#) | [📄 Wasi Naqvi](#) | [✉ wasi.naqvi@mail.mcgill.ca](mailto:wasi.naqvi@mail.mcgill.ca)

Education

- 2025– **M.Sc. Physics, McGill University** GPA: 4.00/4.00
Supervisor: Nicolas B. Cowan
Thesis: HiERarchical Modelling in Exoplanet Science.
- 2021–25 **B.Sc. Physics (Honours), The University of British Columbia** GPA: 4.00/4.33
Minor in Data Science and Statistics
Thesis: Simulating In-Orbit Performance for the CASTOR Mission
Supervisor: Tyrone Woods
Distinctions: Dean's List, Best Thesis Award

Publications

Naqvi, W. M. F. and Cowan, N. B. *HERMES: HiERarchical Modelling for Exoplanet Science*. Royal Astronomical Society, Techniques and Instruments (in prep.)

Côté et al. (including **Naqvi, W.**). *The CASTOR Mission*. Special Issue, Journal of Astronomical Telescopes, Instruments, and Systems, SPIE.

Awards & Honours

- 2025 Kharusi Family International Science Fellowship, McGill University \$5,000 CAD
2021–25 Karen McKellin International Leader of Tomorrow Award, UBC \$250,000 CAD

Contributed Talks & Posters

♂ Contributed 📄 Poster

- 📄 Head in the clouds? Investigating clouds and hazes in future exoplanet missions. Jun 2026
CASCA Annual General Meeting. Montréal, Canada
- ♂ Comparative climatology of exoplanets using Hierarchical Modelling, May 2026
Trottier Institute for Research on Exoplanets Montréal, Canada
- ♂ HERMES: HiERarchical Modelling for Exoplanet Science Mar 2026
Ariel Open Conference '26 ESA Harwell, UK
- ♂ BayesBall: Bayesian Modelling for sport analytics, Nov 2025
Trottier Space Institute Lunch Talks Montréal, Canada
- ♂ Developing a detector simulation pipeline for the CASTOR mission, Jun 2026
The CASTOR Mission Consortium, NRC Herzberg Astronomy & Astrophysics, Victoria, Canada

Research & Work Experience

Trottier Institute for Research on Exoplanets, McGill University Montréal, QC
Summer Researcher May 2025–Present
Hierarchical Bayesian Modelling of planetary targets to probe population-level trends for the Ariel Space Mission.

NRC Herzberg Astronomy & Astrophysics Victoria, BC
Junior Adaptive Optics Research Scientist Jan 2025–Present
Implementing a convolutional neural network on an Adaptive Optics test bench for the 1.2 m REVOLT Telescope at the Dominion Astrophysical Observatory. Running machine-learning simulations alongside lab experiments under Dr. Maaike van Kooten.

TRIUMF

Universal Polarization Research Assistant

Devising a Faraday Rotation method to measure polarization of optically-pumped Rb vapour at ISAC-II. Writing numerical simulations for polarizer experiments and developing a universal laser-polarization method for isotopes with unknown atomic transitions.

Vancouver, BC
Sep 2024–Present

NRC Herzberg Astronomy & Astrophysics

Junior Research Scientist

Designed Python software pipelines for imaging-sensor simulations and detector modelling for the CASTOR mission (Canadian Space Agency / NRC). Built with Dask (parallel computing) and ESA Pyxel (detector physics).

Victoria, BC
May–Aug 2024

COCANA Lab, UBC Okanagan

Undergraduate Research Assistant

Optimization research for a commercial road-building project (SoftTree Inc.) under Dr. Yves Lucet. Used YALMIP solver; translated codebases between MATLAB and Python with unit-test verification.

Kelowna, BC
May–Aug 2023

CAN-SBX Stratospheric Balloon Design Team

Physics & Data Science Lead

Led physics instrumentation and data analysis. Developed efficient MicroPython / C++ firmware for flight micro-controllers, designed ML models for atmospheric prediction, and assisted with dual-polarising antenna calibration and circuit analysis.

Kelowna, BC
Sep 2023–May 2024

Teaching Assistantships

PHYS 180 Space, Time and Matter

Sep-Dec 2025

PHYS 241 Signal Processing

Jan-Apr 2025

Technical Competitions

Primary role across competitions: building, packaging, and benchmarking Bayesian models, U-Nets, Transformers, and CNNs for scientific data challenges.

ExoHack: Ariel Machine Learning Hackathon (**Winner**)

Mar 2026

NeurIPS Ariel Data Challenge

Jun 2026

Rocky Worlds DDT Challenge

Apr 2026

Community Engagement & Outreach

Founding Member & Organizing Committee, Montréal AstroStats Day

2026–

[Author, Astrobites](#)

2025–

iREx EDI Committee Member

2025–

McGill Hackathon Mentor

2026–

Astro on Tap Volunteer

2026–

Volunteer, McGill Physics “World of STEM” high-school astronomy sessions

2025–

Coordinator, graduate student lunches with TSI seminar speaker

2025–

Facilitator, McGill “From Planets to Particles” family science outreach fair

2025–

Organizing & Administration Volunteer, Exoclines 2025 Conference

2025–

Science Outreach, Trottier Institute for Research on Exoplanets

2025–

UBCO Physics Student Club Treasurer

2021–2025

Exercise is Medicine Coordinator

2023–2025

Volunteer Soccer Coach, Royal Oak, Victoria

2024–2025

Mentor, CERN BeamLine For Schools (BL4S), Cedar College, Karachi

2021–

Science Outreach, Let’s Talk Science Okanagan

2023–2024

Volunteer, Okanagan Food Bank

2022–2024

Volunteer, Student Union Okanagan, UBC

2022–2023

Skills

Programming: Python, C, C++, Julia, Fortran, JavaScript, R, SQL, Shell/Bash

Markup & Typesetting: LaTeX, HTML/CSS, Markdown

Python Ecosystem: PyTorch, JAX, NumPyro, PyMC, Emcee, NumPy, SciPy, Astropy, Scikit-learn, Dask, Matplotlib, Pandas, ArviZ, Corner, Dynesty

Statistical & ML Methods: Hierarchical Bayesian Modelling, Gaussian Processes, MCMC Sampling, Nested Sampling, Simulation-Based Inference, PCA, CNNs, U-Nets, Transformers, Variational Inference, Model Comparison and Benchmarking

N-Body Codes: REBOUND

Computing Infrastructure: CANFAR, DRAC Supercomputing Clusters, Slurm, MPI, Git/GitHub, Docker, Linux

Other Software: Microsoft Excel, Google Sheets

Relevant Coursework

Radiative Processes in Astrophysics, Statistical Learning, Computational Astrophysics, Machine Learning Theory, Probability Theory, Stochastic Processes, Exoplanets and Brown Dwarfs.