Casey Krombein

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Education

University of British Columbia Sept 2021 - Present

Bachelor of Applied Science in Engineering Physics | Minor in Astronomy Vancouver, BC

Professional Experience

UBC Orbit Satellite Design Team

AOCS MAIV Lead May 2025 - Present

- Leading a team of 5 to design, develop, and construct a 3 axis Helmholtz cage from scratch as a magnetic testing apparatus for our cubesat ALEASAT.
- Guiding research, project management, preparing and delivering presentations at team wide integration, and representing the AOCS MAIV team in meetings with the European Space Agency as part of their Fly Your Sat program.
- Made a magnetic field simulation in Python for one axis of a square Helmholtz cage to inform design parameters.

AOCS MAIV Team Member September 2023 - April 2025

- Worked in a team of 4 to attempt to complete a previous team's Helmholtz cage design which was partly manufactured.
- Despite creatively modifying the cage elements as best we could, we eventually discovered the design was deeply flawed and we needed to abandon it and start fresh.

Physics and Astronomy Department, University of British Columbia May 2025 - August 2025

Undergraduate Teaching Assistant - ENPH 253: Introduction to Instrument Design Vancouver, BC

- Helped students with troubleshooting of robot design, manufacturing, circuitry and electronic components, mechanical components and systems, code, PID control, integration testing, and noise mitigation.

Canadian Space Mining Corporation (CSMC) May 2024 - December 2024

Engineering Intern Montreal, QC

- Led CSMC and Mission Control's partnered Swarm Construction project to research and develop advanced concepts for ISRU and swarm robotics with construction applications for both the moon and Earth.
- Designed high level payload systems for lunar rovers as part of the Swarm Construction project, taking into account vacuum conditions, electrostatically charged lunar dust, and other lunar conditions.
- Used dry ice and an ammonia solution to prototype a water purification process for CSMC's Lunapure Technology.
- Performed experiments with copper powder in a packed bed reactor system and was responsible for collecting data and handling samples.

Gina Cody School of Engineering and Computer Science, Concordia University May 2024 - December 2024

Visiting Research Intern Montreal, QC

- CSMC's Hydro+ project was run out of Dr. Melanie Hazlett's lab in a collaboration with Concordia University.
- Trained under a Chemical Engineering PhD student to learn how to run experiments in a reactor system.
- Subsequently took over responsibility for the lab setup and all lab activities, including building a scaled up reactor.
- Was responsible for preparing samples, running experiments, collecting data (including performing Gas Chromatography), documentation, sample handling (extraction, labeling, storage), and cleanup.
- Collaborated with lab technicians and PhD students to share lab space and perform sample testing.
- Wrote documentation, SOPs, and lab procedures, and trained coworkers and a PhD student to run experiments.

Technical Skills

- **Programming:** Python, Matlab, Java, C/C++, Git/Github, Assembly (8051), VHDL (DE0-CV), Linux/WSL
- **Scientific Computing/Modelling:** Numerical Methods (ODEs, PDEs, Calculus, Root Finding, Optimization), Physical Modelling, Data Analysis and Visualization, Image Processing
- **Libraries:** NumPy, SciPy, Matplotlib, OpenCV
- **Engineering:** Solidworks, Machining, Circuit Design and Troubleshooting, Oscilloscope, Function Generator, PID Control, STM32 Bluepill, Digital Logic Design, LaTeX

Achievements

- Dean's List (2022, 2024, 2025)
- Zenith Fellow Intern in the 2024 class of the Zenith Canada Pathways Foundation's Zenith Fellowship
- 2021 Schulich Leader Nominee