Justin Lawrence

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Education

B.Sc Honours in Mathematics, Minor in Physics — *University of British Columbia*
Bachelor's degree program — *September 2019 - May 2024*

- Overall Average: 93.7/100, Graduated with distinction

M.Sc Pure Mathematics — *University of British Columbia*
Master's Degree Program — *September 2024 - Present*

- Thesis work on a TBD topic in algebra with Dr. Rachel Ollivier and Dr. Sabin Cautis

Work experience

UBC Mathematics — *May 2023 - August 2023*
Research Assistant — *Vancouver, Canada*

- Worked with Dr. Ben Williams on characterizing the representations of knot groups in complex special linear groups.
- Determined the actions of knot symmetries on the corresponding knot groups and their representations

UBC Physics and Astronomy — *May 2022 - January 2023*
Research Assistant — *Vancouver, Canada*

- Worked with Dr. Aaron Boley on modelling satellite collisions and resulting debris cascades in the low Earth orbit environment
- Created and implemented multiple atmospheric debris models, based on a JASON-created model, using Python/Numpy

UBC Physics and Astronomy — *May 2021 - August 2021*
Research Assistant — *Vancouver, Canada*

- Worked as part of the SuperCDMS collaboration
- Projected detector response to dark matter signals using alternative dark matter halo model
- Projected sensitivity of future detectors and re-analyzed past runs using alternative model

UBC Science — *September 2020 - April 2021*
Teaching Assistant — *Vancouver, Canada*

- Physics and Mathematics TA for Science One (an enriched first-year science program).
- Role was focused on teaching in both tutorials and office hours.

Technical skills

Programming Languages/Tools	C, C++, Java, Python, Sage, MATLAB, Matplotlib/Scipy/Numpy, Linux (Debian/CentOS), basic knowledge of x86 Assembly
Statistical/Experimental	Experience building and collecting data from experimental apparatus, knowledge of data analysis using various statistical tests

Projects / Clubs

Algebra Textbook *December 2023 - Present*
Sole Contributor

- Cumulative text covering fundamental topics in Algebra, written in a style halfway between personal notes and a published textbook.
- Completed chapters include those on Groups, Rings, and Universal Algebras.
- A pair of chapters on Modules are in progress.
- Chapters on Categories, Field Extensions/Galois Theory, Commutative Algebra, and Homological Algebra are planned.

UBC Physics Society *August 2023 - April 2024*
Academic Coordinator *Vancouver, Canada*

- Helped lead the creation of a math methods workshop on linear algebra for quantum mechanics, and a later workshop on numerical/computational methods in physics.

Thermodynamics Textbook *August 2020*
Co-Contributor

- Co-wrote a 70-page package for the thermodynamics unit of the Science One Physics course.
- Text included an overview of concepts, derivations of formulae, and practice questions with solutions.
- The text was actively being provided to students as a resource in the course as of spring 2024.

Awards

- G.C. Webber Memorial Prize in Mathematics (2024)
- Stanley M. Grant Scholarship in Mathematics (2021, 2023)
- UBC Science Scholar/Dean's Honour List (2019-2022)
- NSERC USRA (Summer 2022, 2023)
- Trek Excellence Scholarship for Continuing Student (2020-2022)
- John Collison Memorial Scholarship in Mathematics (2022)
- Gordon Merritt Shrum Memorial Scholarship (2022)
- The Erich Vogt First Year Summer Research Experience award recipient (received 2020, deferred to 2021)