

# Benjamin Scully

[in Benjamin Scully](#) | [✉ b.scully \[at\] mail.utoronto.ca](mailto:b.scully@mail.utoronto.ca)

## EDUCATION

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### University of Toronto

2025 - Current

PhD - *Astronomy and Astrophysics*

### University of British Columbia

2020 - 2025

BSc - *Combined Honours in Physics and Astronomy*  
with Distinction; Co-operative Education Program

## PUBLICATIONS

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1. **Scully, B.**, Matzner, C. D., & Yalinewich, A., Observability of flashes from ejecta crashes in aspherical supernovae, with application to SN 2008D. *MNRAS*: [10.1093/mnras/stad2360](https://doi.org/10.1093/mnras/stad2360) arXiv: [2307.15859](https://arxiv.org/abs/2307.15859) (Aug. 2023).
2. Sekatchev, M., Liang, X., Majidi, F., **Scully, B.**, Waerbeke, L. V., & Zhitnitsky, A., The Glow of Axion Quark Nugget Dark Matter: (III) the Mysteries of the Milky Way UV Background. *Submitted to JCAP*, arXiv: [2504.15382](https://arxiv.org/abs/2504.15382) (Apr. 2025)
3. Soni, S., et al. incl. **Scully, B.** LIGO Detector Characterization in the first half of the fourth Observing run. *CQG*: [10.1088/1361-6382/adc4b6](https://doi.org/10.1088/1361-6382/adc4b6) arXiv: [2409.02831](https://arxiv.org/abs/2409.02831) (Sep. 2024)

## RESEARCH EXPERIENCE

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### Graduate Research Assistant - *UofT*

Oct 2025 - Present

Supervised by Dr. Marten Van Kirkwijk

- Using interstellar scintillometry to analyze Green Bank Telescope observations of the Crab pulsar to reveal mechanism for poorly understood emissions.

### Undergraduate Honours Thesis - *UBC*

Sep 2024 - Jul 2025

Supervised by Dr. Ludovic Van Waerbeke & Dr. Ariel Zhitnitsky

- Modeling Axion Quark Nugget dark matter model emission spectrum in JWST and Euclid bands to test observation potential.
- Found that the Axion Quark Nugget signal is theoretically detectable with component separation techniques.

### Undergraduate Research Assistant - *TRIUMF*

May - Aug 2024

Supervised by Dr. Jason Holt

- Implemented a new quantum operator in the group-wide code base and identified other necessary improvements in the field of quark mixing.

### Undergraduate Research Assistant - *TRIUMF*

Sep 2023 - May 2024

Supervised by Dr. Katherine Pachal

- Improved mechanical design and assembled scintillators, detector architecture, and wiring of fast scintillator detector paddles for the DarkLight experiment.
- My work helped achieve sub-200 picosecond time resolution.

### Undergraduate Research Assistant - *LIGO UBC*

May - Aug 2023

Supervised by Dr. Jess McIver

- Studied signal vs glitch classification in LIGO/Virgo detectors to improve gravitational wave detection capabilities.
- Developed machine learning, dimensional reduction, and visualization techniques in Python with *KERAS & TensorFlow* to identify gaps in classifier performance.

#### **Undergraduate Research Assistant - *University of Toronto***

*May - Aug 2022*

*Supervised by Dr. Christopher D. Matzner*

- Studied observability of circumstellar ejecta collisions from aspherical supernovae and compared my simulations to observed events.
- Achieved novel conclusions on observables and wrote a paper which was published in MNRAS.

### PRESENTATIONS AND TALKS

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1. **Undergraduate Thesis** *Apr 2025*  
*Axion Quark Nugget Glow: Observing dark matter in modern telescopes*
2. **CUPC 2024 Undergraduate Talk** *Oct 2024*  
*Standard Model Mixology: Exploring Quark Mixing Through Nuclear Theory*
3. **TRIUMF Science Week “Science Pitch” (Honourable Mention)** *Jul 2024*  
*Up is Down: Ab-Initio Approaches to Superallowed Beta Decay to Test for New Physics*
4. **UBC Summer-student Astronomy Colloquium** *Aug 2023*  
*Semi-supervised clustering of LIGO-Virgo signals to improve GSpyNetTree classification*

### POSTERS

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1. **TRIUMF Co-op Poster Presentations** *Aug 2024*  
*Standard Model Mixology: Exploring Quark Mixing Through Nuclear Theory*
2. **TRIUMF Co-op Poster Presentations** *Apr 2024*  
*DarkLight Fast Scintillator Trigger Detector Development*
3. **UofT Dunlap SURP Poster Presentation (Honourable Mention)** *Aug 2022*  
*Do circumstellar collisions make observable transients in aspherical supernovae?*

### AWARDS AND GRANTS

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- Faculty of Arts & Science Top (FAST) Doctoral Award – (\$180 000 over 4 years)** *2025-Present*
- Entrance award for a top incoming domestic student
- Paul Sykes Scholarship in Astronomy – (\$1 200)** *2024*
- Scholarship made on the recommendation of the Department of Physics and Astronomy
- Dante Ciccone Memorial Scholarship in Astronomy – (\$1 575)** *2024*
- Scholarships totaling \$3,150 for graduate or undergraduate students studying astronomy
- Dean of Science Scholarship – (\$280)** *2024*
- Recognizes UBC students for service to faculty and fellow students
- Canadian Institute for Nuclear Physics URS – (\$11 500)** *2024*
- NSERC USRA – (\$11 000)** *2023*
- Charles and Jane Banks Scholarship – (\$270)** *2022*
- Awarded on the recommendation of the Faculty to worthy and deserving students
- NSERC USRA – (\$9 600)** *2022*
- Dean’s Scholar – UBC** *2021-2025*
- Awarded to students with an average of  $\geq 90\%$  the previous Winter Session

## OUTREACH AND SERVICE

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<b>AstroTours Logistics Coordinator (UofT Astronomy Graduates)</b>	<i>Oct 2025 - Present</i>
• Support co-directors in planning astrotours events. Stand in for any absent astrotours chairs.	
<b>Mediation Committee (UofT Astronomy Graduates)</b>	<i>Oct 2025 - Present</i>
• Acts to mediate disputes within the department. Advocates for a fair graduate stipend annually.	
<b>UBC PHAS EDI Committee</b>	<i>May 2024 - May 2025</i>
• Member of the UBC Physics Department's Equity Diversity and Inclusion committee with the goal of providing guidance on policy changes, and inspiring new initiatives	
• My responsibilities center around establishing professional development and effective resources for members of the community.	
<b>Girl Guide Physics Activities</b>	<i>Jan 2024 - Apr 2025</i>
• Taught interactive physics activities to Girl Guide groups of ages 5-12.	
• Activities included LED circuits, spaghetti towers, and instruction about general relativity	
<b>UBC Physics Olympics</b>	<i>Mar 2023 - Mar 2025</i>
• Formulated rules, designed and ran pre-build competition in 2024 and currently for 2025	
• Ran vacuum pump pre-build competition and Quizzics (Physics Quiz) competition in 2023	
<b>UBC Canadian Undergraduate Physics Conference Organizer</b>	<i>Jan - Oct 2024</i>
• Acted as external coordinator in the organization of CUPC at UBC for the Fall of 2024.	
• Handled all aspects of securement, and organization of all nineteen keynote and panellist speakers	
• Additionally managed catering and sponsorship details, and judged student presentations	
<b>UBC Faraday show</b>	<i>Nov 2023</i>
• Annual science lecture to introduce Physics to younger generations	
• Presented to over 300 members of the public	

## SKILLS

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**Programming:** Python (TensorFlow, Astropy), C++, ROOT, Java, Matlab

**Applications:** GitHub, Linux terminal, LaTeX, MadGraph, SolidWorks, Microsoft Office

**Other:** Object oriented design, Data collection & analysis, Computing clusters, Scientific writing, Delicate materials handling, Physical construction/assembly

**Attributes:** Detail oriented, Communication, Public speaking, Teamwork, Empathy

## WORKSHOPS AND SPECIAL PROGRAMS

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<b>Canadian Astroparticle Physics Summer School (CAPSS)</b>	<i>May 2023</i>
<b>French Immersion Dual Dogwood highschool diploma</b>	<i>Jun 2020</i>

## NON-ACADEMIC WORK EXPERIENCE

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<b>Lifeguard &amp; Swim Instructor – City of Rossland</b>	<i>2019 - 2021</i>
<b>Meat shop Cleaner and Cashier – Ferraro Foods</b>	<i>2017 - 2019</i>

## LANGUAGES

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**Fluent:** English, French – **Learning:** Spanish (B1)