

BREANNA CROMPVOETS

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Victoria, BC, Canada

breanna-crompvoets

EDUCATION

University of Victoria • Ph.D. Astronomy

2024-Present Victoria, BC

- Supervisor: Dr. James Di Francesco
- Dissertation Subject: Relationship Between YSOs and Dense Environments

University of Victoria • M.Sc. Astronomy

2021-2023 Victoria, BC

- Supervisor: Dr. James Di Francesco
- Cumulative GPA: 8/9
- Thesis Title: Application of Machine Learning Techniques To Young Stellar Object Classification

University of Regina • B.Sc. Honours Physics

2017-2021 Regina, SK

- Graduating GPA: 91.47%
- Thesis Title: Resonance Structures Within the Distant Kuiper Belt

RESEARCH EXPERIENCE

PhD Research • University of Victoria

2024-Present Victoria, BC

Investigating young stellar object production in dense environments.

Masters Research • University of Victoria

2021-2023 Victoria, BC

Machine learning classification of young stellar objects from astronomical surveys.

Honours Project - OSSOS • University of Regina

2020-2021 Regina, SK

Analysis and simulation of orbital parameters for objects within distant resonances in the Transneptunian Belt.

Origin of Life • McMaster University

Summer 2020 Virtual

Analysis of RNA polymerization obtained from the Planet Simulator at McMaster's Origin of Life Laboratory.

AWARDS

2024-2027

NSERC P-GSD • \$63 000
President's Research Scholarship • \$5000

2022-2023

Dr. Peter Montgomery Graduate Scholarship • \$2608

2021-2022

BC Graduate Scholarship • \$15 000
The Reverend Gerald F. Lahey, S.J. Prize • \$500
[+ 1 more](#)

2020-2021

NSERC Undergraduate Student Research Award • \$8000
Petar C. Hein Memorial Scholarship in Physics • \$4000
[+ 1 more](#)

2019-2020

UofR Undergraduate Research Award • \$8200
Edmond Campion Anniversary Award • \$1000
Huber Undergraduate Physics Scholarship • \$900
[+ 1 more](#)

2018-2019

City of Regina Henry Baker Scholarship • \$2000
Dr. Neil Knecht Scholarship in Physics • \$1450
[+ 6 more](#)

2017-2018

Centennial Merit Plus Scholarship • \$3000
Reverend John Matheson, S. J. Scholarship • \$500

GlueX • University of Regina and Jefferson Lab

📅 Summer 2019

📍 Regina, SK; Newport News, VA

Noise and resolution measurements of photomultiplier tubes and experimental determination of saturation in silicon photomultipliers.

TEACHING EXPERIENCE

Teaching Assistantships - Labs • University of Victoria

📅 2021-Present

📍 Victoria, BC

Taught labs in Phys 102A (Fall 2021), Astro 101 (Fall 2022, Spring 2023).

Teaching Assistantships - Marking • University of Regina

📅 Spring 2020 - Spring 2021

📍 Regina, SK

Marked introductory physics assignments (Phys 111/112 at UofR) for three semesters and made recommendations that were used to improve the class.

Tutor • University of Regina

📅 Fall 2018 - Spring 2021

📍 Regina, SK

Tutored in the subjects of Physics, Astronomy, Computer Science, Calculus, and Chemistry.

PUBLICATIONS AND CONFERENCE PRESENTATIONS

Cromptvoets, B. L., Teimoorinia, H., Di Francesco, J. (2024) Climbing the Cliffs: Classifying YSOs in the Cosmic Cliffs JWST Data using a Probabilistic Random Forest. Submitted.

Petit, J.-M., Gladman, B., Volk, K., **Cromptvoets, B.**, Lawler, S., Beaudoin, M., Peltier, L., Bannister, M., Alexandersen, M., Chen, Y.-T., Gwin, S., and Kaib, N. (2023) The OSSOS++ comprehensive model of the Kuiper belt. AAS/Division for Planetary Sciences Meeting. 55: 209.04.

Cromptvoets, B. L., Teimoorinia, H., Di Francesco, J. (2023) Young Stellar Objects in NGC 3324 Found with James Webb. Protostars and Planets VII. Poster.

Cromptvoets, B. L., Lawler, S. M., Volk, K., Chen, Y. -T., Gladman, B., Peltier, L., Alexandersen, M., Bannister, M. T., Gwyn, S., Kavelaars, J. J., Petit, J. -M. (2022) OSSOS XXV: Large Populations and Scattering-Sticking in the Distant Trans-Neptunian Resonances. Planetary Science Journal. 3: 113-127.

Lawler, S., Pike, R., Alexandersen, M., **Cromptvoets, B.**, Peltier, L., and Volk, K. (2022) The Populations of Plutinos and Other Resonant TNOs in the Distant Solar System. AAS/Division of Dynamical Astronomy Meeting. 54: 202.04.

Cromptvoets, B. L., Teimoorinia, H., Di Francesco, J. (2022) Machine Learning Methods Applied to Star Formation Classification. CASCA AGM. Poster and Flash Talk.

Cromptvoets, B. L., Lawler, S. (2021) Large Populations in the Distant Trans-Neptunian Resonances. CASCA AGM. Poster.

Cromptvoets, B. L. (2020) Experimental Determination of Saturation in SiPMs. Canadian Conference for Undergraduate Women in Physics. Presentation.

Cromptvoets, B. L. & Ross, D. (2019) Experimental Determination of Saturation in the BCAL SiPMs. Internal Report, GlueX-doc-4135.

OUTREACH

“Deep Sky” Annual Passholder Event • **Royal BC Museum**

📅 Jan 24 2024

📍 Victoria, BC

Joined a panel to discuss James Webb Space Telescope research and capabilities with the public after the showing of the associated documentary.

Ask an Astronomer! YouTube Show • **H.R. MacMillan Space Centre**

📅 Dec 14 2023

Presented a talk, available on YouTube on “AI in Space”. The talk was centred on demystifying AI and talking about how I use machine learning techniques for my research.

Let’s Innovate! Podcast • **Science Fair Foundation**

📅 Nov 2023

Spoke as an invited guest on a podcast concerning how science fairs and youth innovation fairs are judged.

Speakers Bureau • **University of Victoria**

📅 Sept 2022-May 2023

📍 Victoria, BC

Spoke to Grade 3, 4, and 5 students on the life cycle of stars and the change to Pluto’s planetary classification at the following schools:

- John Stubbs Memorial School (Age 10, Class size: 28, Date: Oct 18, 2022)
- Doncaster Elementary School (Age 9, Class size: 26, Dates: Feb 7, 2023, Feb 28, 2023)
- Selkirk Montessori School (Age 9, Class size: 2x30, Date: Apr 4, 2023)
- Frank Hobbs School (Age 10-11, Class size: 23, Date: May 17, 2023)

The Speaker’s Bureau program has since been retired.

Science Fairs and Summer Schools

• **West Kootenay Science & Technology Fair**

📅 Mar 16 2024

📍 West Kootenay, BC

I judged a subset of projects given by students throughout the West Kootenay region.

• **Youth Innovation Showcase**

📅 Nov 2022, 2023

📍 BC

I judged a subset of the projects given by grade-school students across the province, as well as I judged semi-finals and finals for the high school categories.

• **Vancouver Island Regional Science Fair**

📅 Apr 10 2022

📍 Vancouver Island, BC

I acted as a judge of a subset of projects given by students across the island.

• **Engaging Youth in Engineering and Science (EYES)**

📅 May 2021

📍 Regina, SK

I “made” comets with a group of 12-13 year olds as part of a summer science camp.

OTHER VOLUNTEER ACTIVITIES

Build Club Co-Founder • University of Regina

📅 Sept 2018 - Nov 2021

📍 Regina, SK

Myself and three other students founded this Club to teach undergraduate students how to build and operate scientific equipment, as well as to have a small project which could be brought to high schools as part of our outreach activities. We obtained grant funding, built a muon detector, down-sized it to be a handheld rather than room-wide set-up, and brought the completed project to a school in a small town (Weyburn) in Saskatchewan.

President of Physics Student Society • University of Regina

📅 Sept 2019 - Apr 2021

📍 Regina, SK

I acted as President of the Physics Student Society for two years, including 14 months during COVID. My time as President saw an increase in student engagement, and I personally increased the online support available to students as far as academic materials and mental health initiatives.

Mentoring and University Panels

• PAGSA Research Night

📅 Mar 14 2024

📍 Victoria, BC

I presented a concise five minute presentation on star formation and my research for an undergraduate audience, and later acted as a member of a panel fielding questions from the undergraduate students. The goal of the event was to share ongoing UVic research in Physics and Astronomy with the undergraduate physics students.

• Peers Mentoring Peers: Women in Science

📅 Sept 2022-Present

📍 Victoria, BC

I have acted as mentor to three female undergraduate Physics students at different stages in their academic journey.

• Graduate Mentor

📅 Sept 2022-Present

📍 Victoria, BC

I have acted as mentor to three graduate students entering Physics and Astronomy graduate studies.

I also sat on a panel for introducing new graduate students to life at the university and what it meant to be a graduate student.