BREANNA CROMPVOETS

University of Victoria

RESEARCH EXPERIENCE

PhD Research • **University of Victoria**

Investigating young stellar object production in dense environments. Spring 2024 - Present.

Masters Research • **University of Victoria**

Machine learning classification of young stellar objects from astronomical surveys. Fall 2021 - Fall 2023.

Honours Project - OSSOS • **University of Regina**

Analysis and simulation of orbital parameters for objects within distant resonances in the Trans-Neptunian Belt. Fall 2022 - Fall 2021.

Origin of Life • **McMaster University**

Analysis of RNA polymerization obtained from the Planet Simulator at McMaster's Origin of Life Laboratory. Summer 2020.

GlueX • **University of Regina and Jefferson Lab**

Noise and resolution measurements of photomultiplier tubes and experimental determination of saturation in silicon photomultipliers. Summer 2019.

AWARDS

2024-2027
NSERC P-GSD • $63 000
President's Research Scholarship • 2 at $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
Huber Undergraduate Physics Scholarship • $900
+ 2 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

PUBLICATIONS AND PROCEEDINGS

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

Petit, J.-M., Gladman, B., Volk, K., **Crompvoets, 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.

Crompvoets, 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., **Crompvoets, 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.

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

CONFERENCE PRESENTATIONS AND POSTERS

Crompvoets, B. L., Teimoorinia, H., Di Francesco, J. (2024) Classifying YSOs in the Cosmic Cliffs JWST Data using a Probabilistic Random Forest. CASCA AGM. Presentation.

Crompvoets, B. L., Di Francesco, J., Teimoorinia, H., Preibisch, T. (2024) Classifying YSOs in the Cosmic Cliffs JWST Data using a Probabilistic Random Forest. Star Formation Across Cosmic Scales Machine Learning Insights and Applications Conference. Presentation.

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

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

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

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

OUTREACH

"Deep Sky" Annual Passholder Event • **Royal BC Museum** Jan 24 2024 Victoria, BC

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

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 4 separate schools. The Speaker's Bureau program was retired at the end of May 2023.

Build Club Outreach • **University of Regina** 2020-2021 Regina,SK and Weyburn SK

Visited three high schools (in person and virtually) to engage youth in considering a career in STEM through two classroom presentations and one career fair.

Summer School Volunteer • **Engaging Youth in Engineering and Science (EYES)** May 2021 Regina, SK

Taught youth about the outer Solar System and built "comets" as a live demonstration.

OTHER VOLUNTEER ACTIVITIES

Panels • **University of Victoria** Sept 2022-Present Victoria, BC

Sat on two panels: one to introduce graduate students to the University of Victoria and life as a graduate student (Sept 2022), the other to field questions from undergraduate studies interested in research (March 2024). The latter included a concise five minute presentation on my research.

Mentoring • **University of Victoria** Sept 2022-Present Victoria, BC

Acted as mentor to three female undergraduate Physics students at different stages in their academic journey through the Peers Mentoring Peers: Women in Science program, as well as to three graduate students entering Physics and Astronomy graduate studies.

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.

Science Fair Judge 2022-Present

Judged projects across all levels (initial through finals) for elementary and high school projects with the West Kootenay Science & Technology Fair (March 2024), Youth Innovation Showcase (November 2023, 2024), and Vancouver Island Regional Science Fair (April 2022).

Build Club Co-Founder • **University of Regina** Sept 2018 - Nov 2021 Regina, SK

Co-founded and ran (alongside three other undergraduate students) a Club to teach undergraduate students how to build and operate scientific equipment, and conduct outreach.

President of Physics Student Society • **University of Regina** Sept 2019 - Apr 2021 Regina, SK

President of the Physics Student Society for two years, including 14 months during COVID. This time saw an increase in student engagement, and online support available to students regarding both academic materials and mental health initiatives.