

BREANNA CROMPVOETS

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breanna-crompvoets

bcrompvoets.github.io

EDUCATION

University of Victoria 2024-Present

Ph.D. Physics and Astronomy

- Supervisor: Dr. Helen Kirk
- Cumulative GPA: 9/9
- Dissertation Subject: Relationship Between YSOs and Dense Environments

University of Victoria 2021-2023

M.Sc. Physics and Astronomy

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

University of Regina 2017-2021

B.Sc. Honours Physics

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

AWARDS

GRADUATE AWARDS: ~ \$145,000

CSA Travel Award \$3176	2025
CSA Travel Award \$2,250	2024
NSERC P-GSD \$107,333	2024
President's Research Scholarship \$5,000 ea	2024, 2025
Dr. Peter Montgomery Graduate Scholarship \$2,608	2022
UVic Graduate Award \$1,000 ea	2022, 2023, 2024
BC Graduate Scholarship \$15,000	2021

UNDERGRADUATE AWARDS: ~ \$27,000

The Reverend Gerald F. Lahey, S.J. Prize \$500	2021
Academic Silver Scholarship - Graduating \$500	2021
NSERC Undergraduate Student Research Award \$8,000	2020
Academic Silver Scholarship - Continuing \$750 ea	2018, 2019, 2020
Petar C. Hein Memorial Scholarship in Physics \$4,000	2020
UofR Undergraduate Research Award \$8,200	2019
Edmond Campion Anniversary Award \$1,000	2019
Huber Undergraduate Physics Scholarship \$900	2019
City of Regina Henry Baker Scholarship \$2,000	2018
Dr. Neil Knecht Scholarship in Physics \$1,450	2018
Elizabeth and George Watson Scholarship \$300	2018
Michael Zerr Memorial Scholarship \$500	2018
Centennial Merit Plus Scholarship \$3,000	2017
Reverend John Matheson, S. J. Scholarship \$500	2017
+ 3 more	

RESEARCH EXPERIENCE

PhD Research | University of Victoria

2024 - Present

Investigating Young Stellar Object production efficiency in dense environments using JWST.

Masters Research | University of Victoria

2021 - 2023

Identified Young Stellar Objects in the Carina Nebula using JWST data, finding a large population of sub-stellar objects and evidence for strong triggering.

Honours Project - OSSOS | University of Regina

2020 - 2021

Simulated orbital parameter distributions for distant mean motion resonances within the Kuiper Belt, resulting in new discoveries of highly inclined distributions.

Origin of Life | McMaster University

Summer 2020

Analyzed RNA polymerization in the Origin of Life laboratory at McMaster University, determining what environmental factors most impact the ability of amino acids to form chains.

GlueX | University of Regina and Jefferson Lab

Summer 2019

Investigated the saturation of Silicon photo-multipliers (SiPMs) resulting in noise and resolution calibrations for the barrel calorimeter of the GlueX experiment.

REFEREED PUBLICATIONS

- Cromptvoets, B. L.**, Di Francesco, J., Teimoorinia, H., Preibisch, T. (2024) Climbing the Cliffs: Classifying Young Stellar Objects in the Cosmic Cliffs JWST Data Using a Probabilistic Random Forest. *Astronomical Journal*. 168: 63-82.
- 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.

NON-REFEREED PUBLICATIONS

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

CONFERENCE PRESENTATIONS AND POSTERS

- Cromptvoets, B. L.**, Kirk, H., Di Francesco, J. (2025) What is that? Multi-object Identification in Galactic Regions with JWST Data and Machine Learning. *CASCA AGM*. Presentation.
- Cromptvoets, B. L.**, Di Francesco, J., Teimoorinia, H. (2024) Classifying YSOs in the Cosmic Cliffs JWST Data using a Probabilistic Random Forest. *CASCA AGM*. Presentation.
- Cromptvoets, 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.
- 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.**, 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.

GRANTS HELD

Fedoruk Centre. "Youth Engagement, Outreach and Female Representation in Nuclear Physics." Co-Applciant \$6,000	Dec 2018 - Aug 2021
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SEMINARS

Star Formation Efficiency in the Era of JWST | **University of Regina - Department of Physics**

Dec 13 2024

OUTREACH TALKS

<i>Star Formation with Breanna Crompvoets</i> Beyond the Jargon Podcast - CFUV 101.9 FM	Mar 14 2025
<i>Star Formation in the Era of JWST</i> Royal Astronomical Society of Canada (RASC) - Regina	Dec 6 2024
<i>Unveiling Hidden Stars in Molecular Clouds with JWST</i> RASC - Victoria	Oct 9 2024
<i>Unveiling Hidden Stars in Molecular Clouds with JWST</i> Island County Astronomical Society	Sept 17 2024
<i>How to Bake a Star</i> Star Party at the Centre of the Universe (2 sessions)	Aug 17 2024
<i>Using ML to Find Forming Stars</i> PAGSA Research Night	Mar 14 2024
<i>AI in Space</i> Ask an Astronomer! (YouTube) - H.R. MacMillan Space Centre	Dec 14 2023
<i>What Science Fair Judges Look For</i> Let's Innovate! Podcast - Science Fair Foundation	Nov 13 2023
<i>How to Make a Comet</i> Engaging Youth in Engineering and Science (EYES) Summer Camp	May 2021
<i>Muons: they're cosmic!</i> Weyburn High School; University of Regina	Mar 4 2020
Speaker's Bureau Talks:	
<i>From Dust to Dust: A Star's Life</i> Various schools (4 sessions); age 9-11	2023
<i>Why Pluto Isn't a Planet: It has Friends!</i> Various schools (2 sessions); age 9-11	2022, 2023

TEACHING AND MENTORING EXPERIENCE

Undergraduate Mentorship Peers Mentoring Peers: Women in Science (4 mentees)	Sept 2022 - Present
Graduate Mentorship Graduate Mentor (4 mentees)	Sept 2022 - Present
Teaching Assistantships - Labs University of Victoria (PHYS 102A and ASTR 101)	Sept 2021 - Present
Teaching Assistantships - Marking University of Regina (PHYS 111 and PHYS 112)	Jan 2020 - Apr 2021
Tutor University of Regina (Astronomy, Calculus, Chemistry, Computer Science, Physics)	Sept 2018 - Apr 2021

OTHER VOLUNTEER ACTIVITIES

Graduate Student Council University Representative CASCA	Sept 2024 - Present
Canadian Youth Exploring Space Volunteer Centre of the Universe	Sept 2024 - Present
"All About Grad School" Panelist University of Victoria	Mar 5 2025
AstroCoffee Host University of Victoria	Jan 2024 - Oct 2024
Science Fair Judge West Kootenay Science & Technology Fair	Mar 16 2024
Graduate Panelist PAGSA Research Night	Mar 14 2024
JWST Panelist "Deep Sky" Annual Passholder Event - Royal BC Museum	Jan 24 2024
Science Fair Judge Youth Innovation Showcase	Nov 2022, 2023, 2024
Science Fair Judge Vancouver Island Regional Science Fair	Apr 2022, 2025
"Welcome to Grad School" Panelist University of Victoria	Sept 2022
Undergraduate Outreach and Lab Skill Club Co-Founder University of Regina	Sept 2018 - Nov 2021
President of Physics Student Society University of Regina	Sept 2019 - Apr 2021

SKILLS

Python, Machine Learning, LaTeX, High Performance Computing, Website Configuration (HTML/CSS)