

# BREANNA CROMPOETS

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## EDUCATION

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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

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### 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

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### 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

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**Crompvoets, 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.

**Crompvoets, B. L.**, Lawler, S. M., Volk, K., Chen, Y. -T., Gladman, B., Peltier, L., Andersen, 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

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Petit, J.-M., Gladman, B., Volk, K., **Crompvoets, B.**, Lawler, S., Beaudoin, M., Peltier, L., Bannister, M., Andersen, 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., Andersen, 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

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**Crompvoets, 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.

**Crompvoets, B. L.**, Di Francesco, J., Teimoorinia, H. (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.

## GRANTS HELD

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Fedoruk Centre. "Youth Engagement, Outreach and Female Representation in Nuclear Physics." | Co-Applicant | **\$6,000**

Dec 2018 - Aug 2021

## SEMINARS

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

Dec 13 2024

# OUTREACH TALKS

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

# TEACHING AND MENTORING EXPERIENCE

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

# OTHER VOLUNTEER ACTIVITIES

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

# SKILLS

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