

# BREANNA CROMPVOETS

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Victoria, BC, Canada

breanna-crompvoets

## EDUCATION

University of Victoria 2024-Present

### Ph.D. Astronomy

- Supervisor: Dr. Helen Kirk
- Dissertation Subject: Relationship Between YSOs and Dense Environments

University of Victoria 2021-2023

### M.Sc. 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: ~ \$135 000

NSERC P-GSD • 2024 • **\$107 333**

President's Research Scholarship • 2024, 2025 • **\$5 000 ea**

Dr. Peter Montgomery Graduate Scholarship • 2022 • **\$2608**

UVic Graduate Award • 2022, 2023, 2024 • **\$1000 ea**

BC Graduate Scholarship • 2021 • **\$15 000**

### UNDERGRADUATE AWARDS: ~ \$27 000

The Reverend Gerald F. Lahey, S.J. Prize • 2021 • **\$500**

Academic Silver Prize • 2021 • **\$500**

NSERC Undergraduate Student Research Award • 2020 • **\$8000**

Academic Silver Scholarship • 2020 • **\$750**

Petar C. Hein Memorial Scholarship in Physics • 2020 • **\$4000**

UofR Undergraduate Research Award • 2019 • **\$8200**

Academic Silver Scholarship • 2019 • **\$750**

Edmond Campion Anniversary Award • 2019 • **\$1000**

Huber Undergraduate Physics Scholarship • 2019 • **\$900**

City of Regina Henry Baker Scholarship • 2018 • **\$2000**

Dr. Neil Knecht Scholarship in Physics • 2018 • **\$1450**

Academic Silver Scholarship • 2018 • **\$750**

Elizabeth and George Watson Scholarship • 2018 • **\$300**

Michael Zerr Memorial Scholarship • 2018 • **\$500**

Centennial Merit Plus Scholarship • 2017 • **\$3000**

Reverend John Matheson, S. J. Scholarship • 2017 • **\$500**

+ 3 more

## RESEARCH EXPERIENCE

PhD Research • University of Victoria

2024-Present

Investigating young stellar object production in dense environments.

Masters Research • University of Victoria

2021-2023

Machine learning classification of young stellar objects from astronomical surveys.

Honours Project - OSSOS • University of Regina

2020-2021

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

Origin of Life • McMaster University

Summer 2020

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

GlueX • University of Regina and Jefferson Lab

Summer 2019

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

## PUBLICATIONS AND PROCEEDINGS

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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.
- 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

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- 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.

## 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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*Star Formation in the Era of JWST* • **Royal Astronomical Society of Canada (RASC) - Regina** 📅 Dec 6 2024

*Unveiling Hidden Stars in Molecular Clouds with JWST* • **RASC - Victoria** 📅 Oct 9 2024

*Unveiling Hidden Stars in Molecular Clouds with JWST* • **Island County Astronomical Society** 📅 Sept 17 2024

*How to Bake a Star* • **Star Party at the Centre of the Universe (2 sessions)** 📅 Aug 17 2024

*Using ML to Find Forming Stars* • **PAGSA Research Night** 📅 Mar 14 2024

*AI in Space* • **Ask an Astronomer! (YouTube) - H.R. MacMillan Space Centre** 📅 Dec 14 2023

*What Science Fair Judges Look For* • **Let's Innovate! Podcast - Science Fair Foundation** 📅 Nov 13 2023

*How to Make a Comet* • **Engaging Youth in Engineering and Science (EYES) Summer Camp** 📅 May 2021

*Muography and Me (and You!)* • **Weyburn High School; University of Regina** 📅 Mar 4 2020

### Speaker's Bureau Talks:

<i>From Dust to Dust: A Star's Life</i> • <b>Frank Hobbs School (Age 10-11, Class size: 23)</b>	📅 May 17 2023
<i>From Dust to Dust: A Star's Life</i> • <b>Selkirk Montessori School (Age 9, Class size: 2x30)</b>	📅 Apr 4 2023
<i>Why Pluto Isn't a Planet: It has Friends!</i> • <b>Doncaster Elementary School (Age 9, Class size: 26)</b>	📅 Feb 28 2023
<i>From Dust to Dust: A Star's Life</i> • <b>Doncaster Elementary School (Age 9, Class size: 26)</b>	📅 Feb 7 2023
<i>Why Pluto Isn't a Planet: It has Friends!</i> • <b>John Stubbs Memorial School (Age 10, Class size: 28)</b>	📅 Oct 18 2022

## TEACHING AND MENTORING EXPERIENCE

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Undergraduate Mentorship • <b>Peers Mentoring Peers: Women in Science (6 mentees)</b>	📅 Sept 2022 - Present
Graduate Mentorship • <b>Graduate Mentor (3 mentees)</b>	📅 Sept 2022 - Present
Teaching Assistantships - Labs • <b>University of Victoria</b>	📅 Fall 2021-Present
• PHYS 102A (Fall 2021)	
• ASTR 101 (Fall 2022, Spring 2023, Fall 2024)	
Teaching Assistantships - Marking • <b>University of Regina</b>	📅 Spring 2020 - Spring 2021
• PHYS 112 (Spring 2020, Spring 2021)	
• PHYS 111 (Fall 2020)	
Tutor • <b>University of Regina</b>	📅 Fall 2018 - Spring 2021
• Astronomy	
• Calculus	
• Computer Science	
• Chemistry	
• Physics	

## OTHER VOLUNTEER ACTIVITIES

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Graduate Student Council University Representative • <b>CASCA</b>	📅 Sept 2024 - Present
Canadian Youth Exploring Space Volunteer • <b>Centre of the Universe</b>	📅 Sept 2024 - Present
AstroCoffee Host • <b>University of Victoria</b>	📅 Jan 2024 - Present
Science Fair Judge • <b>West Kootenay Science &amp; Technology Fair</b>	📅 Mar 16 2024
Graduate Panelist • <b>PAGSA Research Night</b>	📅 Mar 14 2024
JWST Panelist • <b>"Deep Sky" Annual Passholder Event - Royal BC Museum</b>	📅 Jan 24 2024
Science Fair Judge • <b>Youth Innovation Showcase</b>	📅 Nov 2022, 2023, 2024
Science Fair Judge • <b>Vancouver Island Regional Science Fair</b>	📅 Apr 10 2022
"Welcome to Grad School" Panelist • <b>University of Victoria</b>	📅 Sept 2022
Undergraduate Outreach and Lab Skill Club Co-Founder • <b>University of Regina</b>	📅 Sept 2018 - Nov 2021
President of Physics Student Society • <b>University of Regina</b>	📅 Sept 2019 - Apr 2021