BREANNA CROMPVOETS

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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: $\sim \$142,000$

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: $\sim \$27,000$

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 in dense environments to determine impact of environment on efficiency 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

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., 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., **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.

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.

GRANTS HELD

Fedoruk Centre. ”Youth Engagement, Outreach and Female Representation in Nuclear Physics.” | Co-Applicant | **$6,000** Dec 2018 - Aug 2021

SEMINARS

Star Formation Efficiency in the Era of JWST | **University of Regina - Department of Physics** Dec 13 2024

OUTREACH TALKS

Star Formation with Breanna Crompvoets | **Beyond the Jargon Podcast - CFUV 101.9 FM** Mar 14 2025

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

Muons: they're cosmic! | **Weyburn High School; University of Regina** Mar 4 2020

Speaker's Bureau Talks:

From Dust to Dust: A Star's Life | **Frank Hobbs School (Age 10-11, Class size: 23)** May 17 2023

From Dust to Dust: A Star's Life | **Selkirk Montessori School (Age 9, Class size: 2x30)** Apr 4 2023

Why Pluto Isn't a Planet: It has Friends! | **Doncaster Elementary School (Age 9, Class size: 26)** Feb 28 2023

From Dust to Dust: A Star's Life | **Doncaster Elementary School (Age 9, Class size: 26)** Feb 7 2023

Why Pluto Isn't a Planet: It has Friends! | **John Stubbs Memorial School (Age 10, Class size: 28)** Oct 18 2022

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 Assitantships - Labs | **University of Victoria (PHYS 102A and ASTR 101)** Sept 2021 - Present

Teaching Assitantships - 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 10 2022

"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)