

# Justine Obidowski

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## RESEARCH INTERESTS

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Planetary system formation and evolution, exoplanet characterization and detection, transneptunian objects, orbit dynamics, protoplanetary disks, rogue planets, formation of moons, asteroids and comets, spectroscopy of exoplanet atmospheres, binary star systems, galaxy formation and evolution

## EDUCATION

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| <b>Doctor of Philosophy in Astronomy</b><br><i>University of British Columbia</i>  | 2025 – Present |
| <b>Master of Science in Astronomy</b><br><i>University of British Columbia</i>   | 2023 – 2025    |
| <b>Honors Bachelor of Science: Astronomical Science Specialist, Physics Major, Mathematics Minor</b><br><i>University of Toronto Mississauga</i> | 2019 – 2023    |

## RESEARCH EXPERIENCE

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| <b>TNO Absolute Magnitude Distribution</b><br><i>Department of Physics &amp; Astronomy, University of British Columbia</i><br><i>Supervisor: Brett Gladman</i> <ul style="list-style-type: none"><li>• Research project for MSc. thesis</li><li>• Determined the TNO absolute magnitude distribution for H=7-10 using TNOs detected in the observation survey, CLASSY (Classical and Large-A Solar System Survey).</li><li>• Used the shift and stack method with a machine learning detection algorithm and manual image examination to detect TNOs in observation images taken by CFHT (Canada-France-Hawaii Telescope).</li><li>• Determined orbital properties of detected TNOs and linked detections of the same objects across multiple nights.</li></ul> | Sept 2023 – Aug 2025 |
| <b>Observations of Irregular Moons of Jupiter and Saturn</b><br><i>University of British Columbia, Cornell University, NASA Jet Propulsion Laboratory</i><br><i>Observation team members: Brett Gladman, Marina Brozovic, Phil Nicholson, Chantal Hemmann</i> <ul style="list-style-type: none"><li>• Travelled to Palomar Observatory to observe irregular moons of Jupiter and Saturn using the Hale Telescope.</li><li>• Analyzing the colors and orbital properties of irregular moons in the same groups and comparing them to past observations.</li><li>• Took additional observations of irregular moons and TNOs using UBC's Southern Observatory, Thunderbird South.</li></ul>  | Oct 2024 – Nov 2024  |
| <b>Oort Cloud Formation and Evolution in Star Clusters</b><br><i>David A. Dunlap Department of Astronomy &amp; Astrophysics, University of Toronto</i><br><i>Supervisor: Jeremy Webb</i> <ul style="list-style-type: none"><li>• Worked on a research project about Oort cloud formation and evolution in star clusters</li><li>• Began as part of the Summer Undergraduate Research Program (SURP)</li><li>• Created and analyzed N-body simulations of comets orbiting solar mass stars within a star cluster throughout the cluster's evolution.</li></ul>   | May 2022 – June 2025 |
| <b>Using a Computational Microscope to Study Protein Structure and Dynamics</b><br><i>Department of Chemical &amp; Physical Sciences, University of Toronto Mississauga</i><br><i>Supervisor: Sarah Rauscher</i> <ul style="list-style-type: none"><li>• Worked on a biophysics research project about intrinsically disordered proteins, specifically about intrinsically disordered regions (IDRs) in K<sup>+</sup> channel function.</li><li>• Worked on the research project as a part of the Research Opportunity Program.</li></ul>   | May 2021 – Aug 2021  |

## WORK AND EXTRACURRICULAR EXPERIENCE

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### Teaching Assistant

Department of Physics & Astronomy, University of British Columbia

ASTR310

Sept 2024 – Present

- Responsible for teaching tutorials, grading worksheets, and invigilating exams.

ASTR507/407

Jan 2025 – Apr 2025

- Responsible for grading assignments and exams

ASTR101, 102

Sept 2023 – Apr 2024

- Responsible for teaching labs, grading lab reports, and invigilating exams.

### IT Consultant

May 2021 – Aug 2023

Stratical Technologies

- Responsible for resetting, imaging, cleaning, and shipping laptops.

### Director of Finance and Marketing

Apr 2020 – Apr 2023

UTM Physics Club

- Responsible for managing the club's financial affairs such as spending, funding, and creating financial statements (e.g. income statements and balance sheets).

## AWARDS AND ACHIEVEMENTS

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**Undergraduate Student Research Award**, *Natural Sciences and Engineering Research Council of Canada (NSERC)* 2022

**Moore Award in Physics**, *University of Toronto Mississauga* 2021

**John Pounder Prize in Astronomy**, *University of Toronto Mississauga* 2020

**Dean's List Scholar**, *University of Toronto* 2020/2021/2022/2023

## PAPERS

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1. **Obidowski J.**, Webb J., Zwart S. P., Cai M., 2025, "Oort Cloud Formation and Evolution in Star Clusters". 2025 ApJ 987(29).

## CONFERENCE PRESENTATIONS

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1. **Obidowski J.**, Fraser W., Lawler, S., Gladman, B., Kavelaars J., Petit, J-M., et al. 2025, "TNO Absolute Magnitude Distributions for H=7-10". CFHTUM2025. <https://www.cfht.hawaii.edu/en/news/UM2025/abstractdetails.php?id=360>
2. **Obidowski J.**, Fraser W., Lawler, S., Gladman, B., Kavelaars J., Petit, J-M., et al. 2024, "TNO Absolute Magnitude Distributions for H=7-10". TNO2024. <https://tno2024.org/relation/abstract/102>
3. Ashton E., **Obidowski J.**, Gladman B., Fraser W., Lawler S., Kavelaars J., et al. 2024, "Probing the luminosity function of the Kuiper Belt down to Hr of 10 using CLASSY". AAS Division for Planetary Sciences meeting #56. Bulletin of the AAS, 56(8). <https://baas.aas.org/pub/2024n8i211p07/release/1>

## POSTERS

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1. **Obidowski J.** & Webb J. 2022, "Oort Cloud Evolution in Star Clusters", Summer Undergraduate Research Program, Final Poster Session. [https://oort\\_cloud\\_evolution\\_poster](https://oort_cloud_evolution_poster)
2. **Obidowski J.**, Lee E., Rauscher S. 2021, "Investigating Intrinsically Disordered Proteins in K<sup>+</sup> Channel Function", Research Opportunity Program, Smarti Gras event. [https://intrinsically\\_disordered\\_proteins\\_poster](https://intrinsically_disordered_proteins_poster)

## SUMMARY OF SKILLS

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- **Computer Programming**
  - Coding experience in Python, MATLAB, and Bash, primarily for scientific purposes such as data analysis, calculations, plotting, and simulations.
  - Coding experience in JavaScript, C#, HTML, and CSS, primarily for website creation and design.
- **Writing & Presenting**
  - Experience writing lab reports and research papers using LaTeX.
  - Experience presenting research projects at conferences and events using PowerPoint.

- **Data Analysis**
  - Adept at using equations, statistics, and plots to represent and analyze data.
- **Time Management & Problem Solving**
  - Experience solving complex mathematics, physics, and astronomy problems.
- **Communication & Teamwork**
  - Collaborated with numerous diverse groups for academic, research, and work projects.

## OUTREACH

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### Partial Solar Eclipse Event

Oct 2024

*Roles:* Supervisor, Planning Team

UBC Physics & Astronomy department event where we handed out eclipse glasses to people to observe the partial solar eclipse. Interviewed about the event by UBC News.

### Perseids Meteor Shower Event

Aug 2022

*Roles:* Funds Manager, Telescope Provider and Supervisor

An observation night field trip to observe the Perseids meteor shower planned by the UTM Physics Club and UofT Amateur Astronomer's Society.

### Starry September

Sept 2022

*Role:* Planning Team

Astronomy viewing night in collaboration with the Royal Astronomical Society of Canada (RASC) and the UTM Physics Club at the University of Toronto Mississauga campus.