Justine Obidowski

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RESEARCH INTERESTS

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

Doctor of Philosophy in Astronomy 2025 – Present
University of British Columbia

Master of Science in Astronomy 2023 – 2025
University of British Columbia

Honors Bachelor of Science: Astronomical Science Specialist, Physics Major, Mathematics Minor 2019 – 2023
University of Toronto Mississauga

RESEARCH EXPERIENCE

TNO Absolute Magnitude Distribution Sept 2023 – Aug 2025
Department of Physics & Astronomy, University of British Columbia
Supervisor: Brett Gladman

- Research project for MSc. thesis
- 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).
- 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).
- Determined orbital properties of detected TNOs and linked detections of the same objects across multiple nights.

Observations of Irregular Moons of Jupiter and Saturn Oct 2024 – Nov 2024
University of British Columbia, Cornell University, NASA Jet Propulsion Laboratory
Observation team members: Brett Gladman, Marina Brozovic, Phil Nicholson, Chantal Hemmann

- Travelled to Palomar Observatory to observe irregular moons of Jupiter and Saturn using the Hale Telescope.
- Analyzing the colors and orbital properties of irregular moons in the same groups and comparing them to past observations.
- Took additional observations of irregular moons and TNOs using UBC's Southern Observatory, Thunderbird South.

Oort Cloud Formation and Evolution in Star Clusters May 2022 – June 2025
David A. Dunlap Department of Astronomy & Astrophysics, University of Toronto
Supervisor: Jeremy Webb

- Worked on a research project about Oort cloud formation and evolution in star clusters
- Began as part of the Summer Undergraduate Research Program (SURP)
- Created and analyzed N-body simulations of comets orbiting solar mass stars within a star cluster throughout the cluster's evolution.

Using a Computational Microscope to Study Protein Structure and Dynamics May 2021 – Aug 2021
Department of Chemical & Physical Sciences, University of Toronto Mississauga
Supervisor: Sarah Rauscher

- Worked on a biophysics research project about intrinsically disordered proteins, specifically about intrinsically disordered regions (IDRs) in K+ channel function.
- Worked on the research project as a part of the Research Opportunity Program.

WORK AND EXTRACURRICULAR EXPERIENCE

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

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

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

CONFERENCE PRESENTATIONS

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

1. **Obidowski J.** & Webb J. 2022, "Oort Cloud Evolution in Star Clusters", Summer Undergraduate Research Program, Final Poster Session. https://oort_cloud_evolution_poster
2. **Obidowski J.**, Lee E., Rauscher S. 2021, "Investigating Intrinsically Disordered Proteins in K+ Channel Function", Research Opportunity Program, Smarti Gras event. https://intrinsically_disordered_proteins_poster

SUMMARY OF SKILLS

- **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

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.