

Talia M. O'Shea

University of Wisconsin-Madison | tmoshea@wisc.edu | ORCID ID:0009-0006-0548-9855

Education

University of Wisconsin-Madison, Ph.D. candidate in Astronomy, in progress	Aug 2023 – Present
University of Wisconsin-Madison, M.S. in Astronomy	Aug 2023 – May 2025
Wellesley College, B.A. in Astrophysics (Honors) and History	Sept 2019 – May 2023
<ul style="list-style-type: none">Summa Cum LaudeHonors Thesis: <i>The influence of dynamical friction on measurements of galaxy cluster size</i>	

Publications

O'Shea T.M., Heinz S., Soares-Furtado M., et al., *Shooting for the stars: Jet-mode feedback and AGN jet deceleration from stellar mass-loading*. To be submitted to ApJ, June 2025.

O'Shea T.M., Borrow J., O'Neil S., Vogelsberger M., *Dynamical friction and measurements of the splashback radius in galaxy clusters*. Under review at OJAp.

Research Experience

Mass-loading in AGN jet simulations, PI Dr. Sebastian Heinz; UW-Madison Aug 2023 - Present
Developing simulations of mass-loading in AGN jets using unstructured moving-mesh code Arepo.

Galaxy cluster dynamics, PI Dr. Josh Borrow, Dr. Mark Vogelsberger; MIT May 2022 - Aug 2023
Simulated galaxy cluster dynamics using initial data from IllustrisTNG, to quantify the impact of dynamical friction on measurements of galaxy cluster splashback radii. Produced first -author paper under review at OJAp.

Low-energy electron production, PIs Dr. James Battat, Dr. Chris Arumainayagam; Jan 2021 - Oct 2022
Wellesley College
Developed, ran, and analyzed simulations using Geant4-DNA to understand production of low-energy electrons in water radiolysis processes, as well as by cosmic rays in ice grains with dense molecular clouds.

Presentations

University of Maryland, *Invited Talk*, "Dynamical friction and measurements of galaxy cluster size," November 2024.

University of Pennsylvania, *Invited Seminar*, "Dynamical friction and measurements of galaxy cluster size," October 2023.

Wellesley College Ruhlman Conference, *Contributed Talk*, "Dynamical friction in galaxy clusters," April 2023.

American Astronomical Society 240th Conference, *Contributed Talk*, "Low-energy (<20 eV) electrons in Geant4 Monte Carlo Simulations," Summer 2022.

Wellesley College Tanner Conference, *Co-Presenter; Contributed Talk*, "On Becoming a Scientist: Finding Our Passion Through Wellesley's Summer Research Program," Fall 2021.

American Astronomical Society 238th Conference, *Virtual Contributed Talk*, "Investigating the relative importance of low-energy (<20 eV) electrons in astrochemistry via Monte Carlo simulations," Summer 2021.

Selected Posters

American Astronomical Society 244th Conference, "The impact of main sequence stellar mass loading on AGN jet feedback," June 2024.

Beckman Symposium, "Dynamical friction has limited impact on galaxy cluster splashback radii," August 2023.

Keck Northeast Astronomy Consortium, "Assessing the influence of dynamical friction on galaxy cluster splashback radius," Fall 2022.

Teaching Experience

Teaching Assistant: ASTRON 103 (Introductory Astronomy); UW-Madison	Sep 2023 – Dec 2023
Learning Assistant: PHYS 106 (Introductory Electromagnetism); Wellesley College	Sept 2021 – May 2023
Grader: Wellesley College Math and Physics Department	Jan 2020 – May 2023

Mentoring Experience and Certificates

Delta Program Research Mentor Training; UW-Madison	May 2024
---	----------

Direct mentor to:

- Rachel G., UW-Madison undergraduate (Jan 2025 - Present)

Grants and Awards

Wisconsin Space Grant Consortium Graduate Research Fellowship	Apr 2025
Honorable Mention NSF Graduate Research Fellowship	Apr 2025
Beckman Scholar , Arnold and Mabel Beckman Foundation (\$21,000)	2021 - 2023
Phyllis J. Fleming Prize , Wellesley College Physics Department	May 2023
Whiting Medal , Wellesley College Astronomy Department	November 2023
Massachusetts Space Grant (\$5,000)	2022
National Merit Scholarship , Textron Corporation (\$5,000)	2019 - 2023

Service

Department Committees

Undergraduate Symposium Planning Committee; UW-Madison Astronomy Department	Apr 2025 - May 2025
Inclusive Excellence Committee Planning Task Force; UW-Madison Astronomy Department	Feb 2024 – June 2024
Pinanski Prize Committee Student Representative; Wellesley College	Apr 2023

Student Organizations

Peer Mentor Chair; UW-Madison Astronomy Department Running peer mentorship program for first-year graduate students.	Aug 2024 – Present
Society of Physics Students; Wellesley College Served variously as Co-President, Secretary, Department Liaison, and first-year representative, to organize department events and build community. Represented student voices at department meetings.	Dec 2019 - May 2023

Outreach

Universe in the Park Talk, “The First Galaxies,” August 2024, Superior WI.

Skills

Technical: Python, C, Unix, LaTeX, Arepo, Geant4
Languages: Mandarin (fluent; Massachusetts Seal of Biliteracy)
Citizenship: USA, Ireland