



Lorena Mezini, MS



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Physics PhD candidate at the University of Pittsburgh with a focus in large scale statistical and physical modeling of dark matter halos and strong gravitational lensing phenomena.





First Author Research Publications

- 1
- L. Mezini, A. Ç. Şengül, and A. R. Zentner, “Errësirë: A tool for forward modeling realistic mock populations of strong gravitational lenses,” 2025 in prep.
- 2
- L. Mezini, A. R. Zentner, K. Wang, and C. Fielder, “Subhalos are distributed anisotropically about their hosts,” 2025. arXiv: 2406.10150 [astro-ph.GA].  URL: <https://arxiv.org/abs/2406.10150>.
- 3
- L. Mezini, C. E. Fielder, A. R. Zentner, Y.-Y. Mao, K. Wang, and H.-Y. Wu, “The influence of subhaloes on host halo properties,” *Monthly Notices of the Royal Astronomical Society*, vol. 526, no. 3, pp. 4157–4172, Sep. 2023.  DOI: 10.1093/mnras/stad2929.

Work Experience

- 2018 – Present
-  **Teaching Assistant**, University of Pittsburgh
 - Taught recitation sections for introductory physics and astronomy courses.**Graduate Student Researcher/Fellow**, University of Pittsburgh
 - Developed most realistic model of strong gravitational lenses in the field (publication in prep).
 - Synced data from multiple catalogs to forward model large scale populations of strong gravitational lenses using monte carlo method (publication in prep).
 - Created database of mock strong gravitational lens physical properties.
 - Ran statistical analyses of dark matter halo properties with large high resolution numerical simulation data.
 - Developed *DmHaloGeometry*, a software package to perform geometric calculations on 3D coordinate data of physical systems.
- 01/2018 - 08/2018
-  **Student Researcher**, Brookhaven National Laboratory
 - Implemented source separation algorithm on simulated multi-band images of overlapping weakly lensed galaxies.




Education

- 2018 – Present
-  **Ph.D., University of Pittsburgh** Physics.
Thesis title: *Is the Lyric "I can see your halo" in Beyonce's Hit Song "Halo" Accurate and Further Discussion of Dark Matter Halos*
- 2018 – 2023
-  **M.S. Physics, University of Pittsburgh** in Physics.
- 2015 – 2017
-  **BS. Physics and Astronomy, University of Pittsburgh** in Physics and Astronomy.
- 2013 – 2014
-  **Mount Holyoke College** in Physics and Astronomy (transferred to Stony Brook Spring 2015).

Skills

- Coding
-  Python, SQL
- Domain Knowledge
-  MySQL, SQLite, Git & GitHub, PyTorch, Lenstronomy, Pandas, Astropy
- Misc.
-  Academic research, technical writing, teaching and training.

Awards and Achievements

- Present
-  **Super Analytics Challenge**, Developing data oriented solutions for providing health care to local homeless communities.
- 2024
-  **PITT PACC Fellowship**, University of Pittsburgh.
- 2022
-  **Whittington Leadership and Innovation Challenge for Ph.D. Students**, Co-organized *PhDuh-What's next?* – a networking talk series with University of Pittsburgh alumni.

Community Involvement

Present	<div><div></div><div>UPitt Women and Minorities in Physics Club,<ul style="list-style-type: none">- Served as zine editor and on the social media committee from Fall 2019 to Fall 2020, President from Spring 2021 to Spring 2022, and Vice President from Fall 2022 to present.- Organized fundraiser that collected over \$1000 for The Education Partnership to provide supplies for local Pittsburgh area schools.- Wrote proposals that secured \$1000 from APS Women in Physics Group Grants and up to \$1000 from University of Pittsburgh College of Arts and Sciences.</div></div>
	<div><div></div><div>Direct Action Coalition, I co-founded this group to address the systemic inequities that actively affect the lived experiences of members of the Department of Physics and Astronomy at the University of Pittsburgh.</div></div>
2021-2024	<div><div></div><div>E&I Committee, Served as a graduate student representative on University of Pittsburgh Physics department Equity and Inclusion Committee.</div></div>
2022-2023	<div><div></div><div>Graduate Student Mentor, I mentored a small group of University of Pittsburgh Physics PhD students during their first year.</div></div>