Lorena Mezini, MS

lormezini@gmail.com Lorena Mezini https://lmezini.github.io

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 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," 2024. 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

Aug 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.

Jan 2018 - Aug 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*

Aug 2018 – Jun 2023
MS. Physics, University of Pittsburgh in Physics.

Jan 2015 – Dec 2017
BS. Physics and Astronomy, University of Pittsburgh in Physics and Astronomy.

Aug 2013 – Dec 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, My team is 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

- **UPitt Women and Minorities in Physics Club**,
  - Served as zine editor and on the social media committee from Aug 2019 to Dec 2020, President from Jan 2021 to April 2022, and Vice President from Aug 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.
- **Direct Action Coalition**, I co-founded this group in the Spring of 2023 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.

2021-2024

- **E&I Committee**, Served as a graduate student representative on University of Pittsburgh Physics department Equity and Inclusion Committee.

Aug 2022 - Apr 2023

- **Graduate Student Mentor**, I mentored a small group of University of Pittsburgh Physics PhD students during their first year.

April 2022

- **ACCelerate Creativity + Innovation Festival**, I spoke to the public at the Smithsonian National Museum of American History about the Dark Energy Spectroscopic Instrument (DESI) in an exhibit called Making the Largest Maps of the Universe.