# 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 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
**Graduate Student Researcher/Fellow**, University of Pittsburgh
- Developed most realistic model of mock 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 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 Research Intern**, 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 .