Yifan (Megan) Zhao

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Education

University of Pennsylvania   **Philadelphia, PA**
Ph.D in Astrophysics   Sep 2024 -

University of Chicago   **Chicago, IL**
B.S. in Astrophysics; minor in Theater and Performance Studies   Sep 2020 - Jun 2024
Honors thesis: "Convolutional Neural Network for Type Ia Supernova Distance Estimation"

Publications

M. Zhao, P. Swierc, A. Ćiprijanović, B. Nord, "Domain Adaptation for Measurements of Strong Gravitational Lenses", accepted by NeurIPS. [arXiv:2311.17238]
K. Napier, [...], **M. Zhao** et al. "COOL-LAMPS. V. Discovery of COOL J0335−1927, a Gravitationally Lensed Quasar at z=3.27 with an Image Separation of 23.3"", in prep. [arXiv:2305.14317].

Research Experience

UChicago Department of Astronomy and Astrophysics   June, 2023-present
Machine learning in Supernova Cosmology (advised by Prof. J. Frieman)

- Developed machine learning algorithm to predict distance modulus from simulated SNIa dataset using Convolutional Neural Network (CNN)
- Implemented novel data processing method to turn light curve data to image data suitable for ML training

COOL-LAMPS collaboration, UChicago Department of Astronomy and Astrophysics   Jan, 2023-June, 2023
Observation and Analysis of wide-separation lensed quasars (advised by Prof. M. Gladders)

- Observed potential targets using the Magellan Telescopes for 9 nights
- Performed SED analysis with the Prospector package and confirmed the discovery of the newest wide-separation lensed quasar
- Performed lens and source modeling on both Magellan and Herschel data using Galfit

Deep Skies Lab, Fermi National Accelerator Laboratory   June, 2022-June, 2023
Domain Adaptation for Measurements of Strong Gravitational Lenses (advised by Dr. B. Nord, Dr. A. Ćiprijanović)

- Led and developed machine learning algorithm using a domain adaptation technique called Maximum Mean Discrepancy to estimate Einstein radius on simulated strong lenses data
- Designed and simulated strong lensing data imitating the Dark Energy Survey

Presentations

Poster: 243rd Meeting of the American Astronomical Society   upcoming
Poster: NeurIPS, The Machine Learning and the Physical Sciences workshop   Dec, 2023
Poster: Debating the potential of machine learning in astronomical surveys (II)   Nov, 2023
Poster: Midstates Undergraduate Research Symposium in Physical Sciences, Math and Computer Sciences   Nov, 2023
Talk: 2023 Fermilab New Perspectives   June, 2023
Poster: 2023 UChicago Undergraduate Research Symposium   Apr, 2023
Poster: 2023 Conference for Undergraduate Women in Physics   Jan, 2023

Awards

Dean's Fund for Undergraduate Research Conference, $900
The Quad Undergraduate Summer Research Grant, $5500
Jeff Metcalf Fellowship $\times$ 2, $950 $\times$ 2

Revelant Coursework and Skills

Computational Techniques in Astrophysics (A)	Mathematics of Quantum Mechanics (A-)
Mathematical Foundations of Machine Learning (A)	Cosmological Physics (A-)
Statistical Models and Methods (A)	Statistical and Thermal Physics (A)

Observational Techniques in Astrophysics (A-)   Radiation Processes in Astrophysics (A-)
programming languages: Python, C, Java, R, LaTeX.
Membership: American Physical Society

Leadership and Outreach

Society of Asian Scientists and Engineers (SASE) at UChicago
Social Chair   Jan, 2023 - present
- Organize campus wide social events that facilitate connections among the Asian science community
- Establish connections with other minority student organizations and Center for Identity + Inclusion
- Founding member and assist in setting up bylaws and logistics

Society of Women in Physics (SWiP) at UChicago
Co-outreach Director   Sep, 2023 - present
Webmaster   Sep, 2022 - June, 2023
- Assist in science outreach in the local community via science festival, competition, and mentoring
- Maintain the official SWiP website and Instagram page; compile research, funding, and internship resources
- Co-organize events, such as speaker events, mentorship program, and meeting with department officials

Society of Women Engineers (SWE) at UChicago
Director of Service & Outreach   Sep, 2020 – June, 2021
- Published weekly newsletter subscribed by more than 100 high school students world-wide, providing information on outreach activities, programs, and scholarships

University Theatre
Actor, director, assistant stage management, costume-designer   Sep, 2020 - present
- Performed, directed, stage managed, and designed for various student-run theatre festivals and productions, credits include Monologue Festival, Theatre24, The Light, and Cassandra