Hanjue Zhu

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Education

The University of Chicago, Chicago, IL
- Ph.D. Astronomy & Astrophysics (expected) 2026
- B.A. Physics with Specialization in Astrophysics with Honors, B.S. Mathematics 2020

Research Experience

University of California, Santa Barbara, KITP Graduate Fellow Fall 2024
University of Wisconsin, Madsion, Visiting Graduate Researcher 2023 -
The University of Chicago, Graduate/Undergraduate Research Assistant 2017 -

Publications ∗ indicates research supervision

1. **H. Zhu**, N. Y. Gnedin, *On the Properties of Cosmological Ionization Fronts*, in prep for ApJ
2. **H. Zhu**, E. G. Zweibel, N. Y. Gnedin, *Cosmic Ray Mediated Thermal Fronts in the Warm-Hot Circumgalactic Medium*, ApJ submitted, arXiv: 2410.17252
3. **H. Zhu**, N. Y. Gnedin, C. Avestruz, *On the Physical Nature of Lyα Transmission Spikes in High Redshift Quasar Spectra*, 2024, ApJ, 975, 115
4. **H. Zhu**, E. Boettcher, H.-W. Chen, *Spatially Resolved Kinematics of Extraplanar Diffuse Ionized Gas in NGC 3511 and NGC 3513*, 2024, MNRAS, 532, 3252
5. J. Fan*, **H. Zhu**, C. Avestruz, N. Y. Gnedin, *Cosmic Reionization On Computers: Statistics, Physical Properties and Environment of Lyman Limit Systems at $z\sim6$*, 2024, ApJ, 963, 45
6. I. Noel*, **H. Zhu**, N. Y. Gnedin, *Mass-Metallicity Relation during the Epoch of Reionization in the CROC Simulations*, ApJ submitted, arXiv:2210.16750
7. **H. Zhu**, N. Y. Gnedin, *Cosmic Reionization On Computers: Baryonic Effects on Halo Concentrations During the Epoch of Reionization*, 2023, ApJ, 942, 52
8. **H. Zhu**, N. Y. Gnedin, *Gravitational Self-force Errors of Poisson Solvers on Adaptively Refined Meshes*, 2021, ApJS, 254, 12
9. **H. Zhu**, C. Avestruz, N. Y. Gnedin, *Cosmic Reionization on Computers: The Galaxy-Halo Connection between $5 \leq z \leq 10$*, 2020, ApJ, 899, 137
10. **H. Zhu**, C. Avestruz, N. Y. Gnedin, *Cosmic Reionization On Computers: Reionization Histories of Present-day Galaxies*, 2019, ApJ, 882, 2
11. R. Hausen, B. E. Robertson, **H. Zhu**, N. Y. Gnedin, P. Madau, E. E. Schneider, B. Villasenor, N. E. Drakos, *Revealing the Galaxy-Halo Connection Through Machine Learning*, 2023, ApJ, 945, 122
12. M. Lagos, **H. Zhu**, *Gravitational couplings in Chameleon models*, 2020, JCAP, 06, 061
13. C. Avestruz, N. Li, **H. Zhu**, M. Lightman, T. Collett, W. Luo, *Automated Lensing Learner: Automated Strong Lensing Identification with a Computer Vision Technique*, 2019, ApJ, 877, 1

Honors & Awards

Fermilab URA Visiting Scholars Program Award ($22,000) 2024
Dr. Pliny A. and Margaret H. Price Prize, Ohio State University, CCAPP 2024
KITP Graduate Fellowship, Kavli Institute for Theoretical Physics 2024
Two Sigma Fellowship Finalist, Two Sigma 2024
Jeff Metcalf Fellowship ($4,000) , University of Chicago 2019

Blue Waters Student Internship Program ($5,000), National Center for Supercomputing Applications 2018
Heising-Simons Award ($4,000), University of Chicago Department of Physics 2018
Dean's Scholarship, University of Chicago 2016
University Scholarship, University of Chicago 2016

Teaching & Service

Guest Lecturer, University of Chicago
– ASTR 21000, Statistical Techniques in Astrophysics Fall 2023
– ASTR 29800, Undergraduate Research Seminar Spring 2022
Teaching Assistant, University of Chicago
– PHSC 12710, Galaxies 20h/week, Winter 2021
– PHSC 12600, Matter, Energy, Space, and Time 20h/week, Fall 2020
– ASTR 18100, The Milky Way 10h/week, Fall 2017
Referee, Astronomy & Astrophysics 2024 -
Department Committees, Department of Astronomy & Astrophysics, University of Chicago
– A&A Faculty Search Sub-Committee Winter 2021
Focused on candidate evaluation around Justice, Equity, Diversity and Inclusion (JEDI) themes.

Outreach

Mentor for women undergraduate students, Society of Women in Physics Fall 2024 -
Mentor for undergraduate students (grad application), Department of Astronomy & Astrophysics 2022-
Volunteer, Astronomy Conversations at Adler Planetarium Spring 2024 -
Volunteer, Expanding Your Horizons Chicago Spring 2023

Selected Talks & Posters

Price Prize Talk at Ohio State University – Columbus, OH Talk 10/2024
Cosmic Origins: The First Billion Years – Santa Barbara, CA Talk, 09/2024
Cosmic Dawn Revealed by JWST – Santa Barbara, CA Conference Talk, 08/2024
KITP Locals' Lunch Talk – Santa Barbara, CA Talk, 07/2024
First Stars VII – New York City, NY Conference Talk, 05/2024
University of Wisconsin-Madison Astronomy Monday Science Seminar – Madison, WI Talk, 04/2023
UCSB Astro Lunch Talk – Santa Barbara, CA Talk, 02/2023
KITP Workshop on the Cosmic Web – Santa Barbara, CA Conference Talk, 02/2023
BCCP Workshop on Reionization and Cosmic Dawn – Berkeley, CA Conference Talk, 03/2022
Structure Formation Group Seminar, Shanghai Jiao Tong University – Shanghai, China Talk, 12/2019
Midstates Undergraduate Research Symposium – Chicago, IL Talk, 11/2019
Theoretical Cosmology Group Seminar, University of Chicago – Chicago, IL Talk, 10/2019
Galaxy Group Seminar, University of Michigan – Ann Arbor, MI Talk, 09/2019
School of Advanced Science on First Light – São Paulo, Brazil Poster, 08/2019
KICP Spring Postdocs Symposium – Chicago, IL Talk, 06/2019
KICP Winter Postdocs Symposium – Chicago, IL Talk, 03/2019

Technical Skills

Code: ART, Athena++
Programming Languages: Python, C++, C, Mathematica, R, Unix Shell
High Performance Computing: Use of large supercomputing facilities, including Blue Waters and Midway
Paradigms: MPI, OpenMP

Web: HTML5, CSS
Scientific Analysis: MCMC, Bayesian Statistics, ODE Solving, Machine Learning, Computer Vision