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 June 2020

Research Interests

Cosmic reionization & Galaxy formation;
Gaseous, disk-halo interfaces; Interstellar medium;
Computational Astrophysics; numerical methods.
Technical Skills: High Performance Computing, Parallel Computing; Programming Languages: Python, C/C++, OpenMP/MPI, Mathematica.

Publications

(∗ indicates student I mentor)

1. J. Fan*, **H. Zhu**, C. Avestruz, N. Y. Gnedin, *Cosmic Reionization On Computers: Statistics, Physical Properties and Environment of Lyman Limit Systems at z∼ 6*, ApJ submitted, arXiv:2212.07033
2. I. Noel*, **H. Zhu**, N. Y. Gnedin, *Mass-Metallicity Relation during the Epoch of Reionization in the CROC Simulations*, ApJ submitted, arXiv:2210.16750
3. **H. Zhu**, N. Y. Gnedin, *Cosmic Reionization On Computers: Baryonic Effects on Halo Concentrations During the Epoch of Reionization*, ApJ, 942, 52 arXiv:2209.14950
4. 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*, ApJ accepted, arXiv:2204.10332
5. **H. Zhu**, N. Y. Gnedin, *Gravitational Self-force Errors of Poisson Solvers on Adaptively Refined Meshes*, 2021, ApJS, 254, 12, arXiv:2104.10170
6. **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, arXiv:2001.02233
7. M. Lagos, **H. Zhu**, *Gravitational couplings in Chameleon models*, 2020, JCAP, 06, 061, arXiv:2003.01038
8. **H. Zhu**, C. Avestruz, N. Y. Gnedin, *Cosmic Reionization On Computers: Reionization Histories of Present-day Galaxies*, 2019, ApJ, 882, 2, arXiv:1903.06179
9. 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, arXiv:1704.02322

Honors & Awards

Jeff Metcalf Fellowship, University of Chicago 2019
Blue Waters Student Internship, National Center for Supercomputing Applications 2018
Heising-Simons Award, University of Chicago Department of Physics 2018
Dean's Scholarship, University Scholarship, University of Chicago 2016-2020

Student Mentoring

Jiawen Fan (University of Michigan undergrad) *1 paper submitted to ApJ* 10/2021 - Current
- *Lyman limit systems and cosmic reionization*

Isaac Noel (New Trier High School student) *1 paper submitted to ApJ* 9/2021 - Current
- *Mass-metallicity relation at reionization redshifts; Study of OI absorbers at z ∼ 6*

Selected Talks & Posters

UCSB Astro Lunch – Santa Barbara, CA	Talk, 2/2023
KITP Workshop on the Cosmic Web – Santa Barbara, CA	Talk, 2/2023
BCCP Workshop on Reionization and Cosmic Dawn – Berkeley, CA	Talk, 3/2022
Structure Formation Group Seminar, Shanghai Jiao Tong University – Shanghai, China	Talk, 12/2019
Theoretical Cosmology Group Seminar, University of Chicago – Chicago, IL	Talk, 10/2019
Galaxy Group Seminar, University of Michigan – Ann Arbor, MI	Talk, 9/2019
School of Advanced Science on First Light – São Paulo, Brazil	Poster, 8/2019
KICP Spring Postdocs Symposium – Chicago, IL	Talk, 6/2019
KICP Winter Postdocs Symposium – Chicago, IL	Talk, 3/2019

Teaching & Service

Mentor, The Society of Women in Physics (SWiP) at the University of Chicago 2022-2023

Guest Lecturer, University of Chicago

– ASTR 29800, Undergraduate Research Seminar Spring 2022

Delivered lectures on cosmic reionization, numerical simulations & order-of-magnitude analysis.
Wrote homework problems (including interactive Jupyter notebook problems) and held office hours.

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

Teaching Assistant, University of Chicago

– PHSC 12710, Galaxies Winter 2021
– PHSC 12600, Matter, Energy, Space, and Time Fall 2020
– ASTR 18100, The Milky Way Fall 2017