Yunjing Wu

Personal Information

Ph.D. student	Mobile: +86 135 9581 4352
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Education

2019.09 – 2025.06	Ph.D. student in Astronomy, Tsinghua University, Beijing, China Thesis: *Ghostly Galaxies in the High Redshift Universe: Protagonists of Cosmic Metal Enrichment and Their Cosmological Application* Advisor: Prof. Zheng Cai (THU)
2015.09 – 2019.06	B.S. in Astronomy, University of Science and Technology of China, Hefei, China Thesis: *The Observational Discoveries of AGNs on Different Scales* Advisor: Prof. Junxian Wang (USTC)

Employment

2022.07 – 2023.11	Visiting student in Astronomy, Steward Observatory, University of Arizona, Tucson AZ, USA Mentor: Prof. Xiaohui Fan (UofA & SO) & Dr. Feige Wang (Umich)

Research Interests

Circumgalactic medium: **a.** Using the background quasars to study the intervening CGM of foreground galaxies **b.** Connecting galaxies to the cosmic Web

High redshift galaxies: Using multi-wavelength observations (from rest-frame UV to radio) to investigate the physical properties of galaxies.

Research Programs

2019 – Present	The SUPERCOLD-CGM Survey , Member
2019 – Present	MAMMOTH-Subaru survey, Member
2021 – Present	The JWST-ASPIRE survey, Member
2023 – Present	The JWST-MAGNIF survey, Member
2024 – Present	The JWST-SAPPHIRES survey, Member

Selected Telescope Proposals

JWST (PI):	*Probing Pair-Instability Supernovae through the Triply-lensed MACS0647-JD at $z = 10.17$*, **26.3 hours**, Cycle 4, 2024
ALMA (PI):	*Revealing the dominant process that regulates gas-phase metallicity during the ongoing mergers at $z > 6$*, **14.3 hours**, Cycle 10, 2023
ALMA (co-I):	*JAKS: JWST-ALMA-Keck Synergy Study on the Circumgalactic Cold Gas Accretion*

	14.7 hours, Cycle 11, 2024
ALMA (co-I):	*Probing the Cold Molecular Circum-Galactic Medium Around Most Luminous Type-2 QSOs at $z \sim 2$ with ALMA+ACA*, **18.9 hours**, Cycle 11, 2024
MUSE (co-I)	The cosmic Ecosystem of the first QSOs and Galaxies: a MUSE/XSHOOTER/JWST/ALMA Legacy Survey, **large, 147 hours, 2023**
JWST (co-I):	*A SPectroscopic survey of biased halos In the Reionization Era (ASPIRE): A JWST Quasar Legacy Survey*, **65.8 hours**, Cycle 1, 2022
JWST (co-I):	*Mapping the Most Extreme Protoclusters in the Epoch of Reionization*. **47.5 hours**, Cycle 2, 2023
JWST (co-I)	*MAGNIF: Medium-band Astrophysics with the Grism of NIRCam in Frontier Fields*. **42.5 hours**, Cycle 2, 2023
JWST (co-I)	*Emergence of the Baryon Cycle in the First Billion Years*, **20.5 hours**, Cycle 3, 2024
JWST (co-I)	*Mapping Cosmic Structure Evolution: Characterizing Two Massive Galaxy Protoclusters Anchored by $z > 7.5$ Luminous Quasars*, **12.9 hours**, Cycle 3, 2024
MMT (co-I):	*Understanding the galactic feedback by connecting absorption-line systems and Lyα emitting galaxies*, 1.5 nights, 2024A

Observation & Data Reduction Experience

~ 2 **nights**	5.1 m Hale telescope, Cosmic Web Imager (CWI)
~ 20 **nights**	6.5 m Magellan telescopes, FIRE, IMACS, MIKE, & MagE
~ 3 **nights**	8.2 m Subaru telescope, Suprime-Cam

JWST DATA Reduction: NIRCam Imaging, wide field slitless spectroscopy, NIRISS imaging, grism and NIRSpec MOS, IFU
ALMA DATA Reduction (based on CASA)
Spectroscopic Data Reduction (extensively experienced in using Pypeit)

Fellowship & Awards

2025	Outstanding Ph.D. Graduate of Beijing
2025	Excellent Doctoral Dissertation of Tsinghua University Annual award to the best Doctoral Thesis, 1/100
2025	Outstanding graduate students of Tsinghua University, 1/100
2024	Wang Dazhong Scholarship, Tsinghua University, $ 4000 The top student prize for outstanding research in the University
2024	Tsinghua Astrophysics Outstanding (TAO) Scholarship, $ 4000 The top student prize for outstanding research in the department, 1/70
2021, 2023	First Prize in Comprehensive Scholarship, Tsinghua University, total ~ $ 3000
2019	Outstanding undergraduate students of USTC

Teaching Experience

Teaching Assistant, Observational Astrophysics, 2021, 2024 Spring (THU)
Teaching Assistant, Astronomy in a nutshell, 2019 Spring (USTC)

Outreach & Service

2024.07	Diving into the Universe Summer School (to highschool students)
2024.04	**LOC**, Co-evolution of galactic eco-systems and their large-scale environments
2023.10	**LOC**, EREBUS collaboration meeting

Selected Talks, Conference Presentations & Seminars

2024.11	JWST workshop (organizer)	Department of Astronomy, THU
2024.07	Contributed presentation	EAS 2024
2023.11	Visitor talk	Department of Astronomy, NMSU
2023.09	Steward Observatory high-z JWST retreat (on behalf of the SO quasar group)	UofA & SO
2023.08	Special arXiv Coffee	UofA & SO
2021.11	Lunch talk	Department of Astronomy, THU
2021.05	Contributed presentation (Best Oral Presentation)	23rd Guoshoujing Conference

Mentorship

1.	**Sijia Cai**	Tsinghua University, Ph.D. student	2023–now
2.	**Fujiang Yu**	Tsinghua University, Research Assistant	2024–now

References

1.	**Prof. Zheng Cai**,	Tsinghua University,	Email: zcai@tsinghua.edu.cn
2.	**Prof. Xiaohui Fan**,	The University of Arizona,	Email: xfan@arizona.edu
3.	**Dr. Feige Wang**,	University of Michigan,	Email: fgwang@umich.edu

Publication List

24 papers including: 5 first author and 1 2nd-or-3rd author; 310 total citations; h-index = 9;
Full list: ADS Link

First Author; ADS Link

1. **Wu, Y.**, Cai, Z., Li, J., et al., *Searching for C II Emission from the First Sample of $z \sim 6$ O I Absorption-associated Galaxies with the Atacama Large Millimeter/submillimeter Array,* ApJ, 958, 16 (2023).
2. **Wu, Y.**, Wang, F., Cai, Z., et al., *A SPectroscopic Survey of Biased Halos in the Reionization Era (ASPIRE): JWST Discovers an Overdensity around a Metal Absorption-selected Galaxy at $z \sim 5.5$,* ApJL, 956, L40 (2023)
3. **Wu, Y.**, Cai, Z., Sun, F., et al., *The Identification of a Dusty Multiarm Spiral Galaxy at $z = 3.06$ with JWST and ALMA,* ApJL, 942 L1, (2023).
4. **Wu, Y.**, Cai, Z., Neeleman, M., et al., *A [C II] 158 μm emitter associated with an O I absorber at the end of the reionization epoch,* Nature Astronomy, (2021).

5. **Wu, Y.**, Wang, J.-X., Cai, Z.-Y., et al., *More than softer-when-brighter: The X-ray powerlaw spectral variability in NGC 4051,* Science China Physics, Mechanics, and Astronomy, 63, 129512 (2020).

Second, Third Author or Major Contribution; ADS Link

1. Lin, X., Cai, Z., **Wu, Y.**, et al., *Quantifying the Escape of Ly α at $z \approx 5-6$: A Census of Ly α Escape Fraction with H α -emitting Galaxies Spectroscopically Confirmed by JWST and VLT/MUSE,* ApJS, 272, 33 (2024).

Co-author

1. Liu, Z., et al., (including **Wu, Y.**), *Deciphering Gas Dynamics and Star Formation in a z=1.1 Main Sequence Spiral Galaxy with ALMA and JWST,* arXiv e-prints, arXiv:2410.20700 (2024).
2. Jin, X., et al., (including **Wu, Y.**), *A SPectroscopic survey of biased halos In the Reionization Era (ASPIRE): JWST Supports Earlier Reionization around [OIII] Emitters,* arXiv e-prints, arXiv:2410.01318 (2024).
3. Lin, X, et al. (including **Wu, Y.**), *A SPectroscopic Survey of Biased Halos In the Reionization Era (ASPIRE): Broad-line AGN at $z = 4-5$ Revealed by JWST/NIRCam WFSS*ApJ, 974, 147 (2024)
4. Li, M., et al., (including **Wu, Y.**), *MAMMOTH-Subaru. II. Diverse Populations of Circumgalactic Lyα Nebulae at Cosmic Noon,* arXiv e-prints, arXiv:2405.13113 (2024).
5. Fudamoto, Y., et al., (including **Wu, Y.**), *JWST Discovery of* 40+ *Microlensed Stars in a Magnified Galaxy, the "Dragon" behind Abell 370,* arXiv e-prints, arXiv:2404.08045 (2024).
6. Ning, Y., et al., (including **Wu, Y.**), *Unveiling Luminous Lyα Emitters at $z \approx 6$ through JWST/NIRCam Imaging in the COSMOS Field,* ApJL, 963, L38 (2024).
7. Zou, S., et al., (including **Wu, Y.**), *A SPectroscopic survey of biased halos In the Reionization Era (ASPIRE): Impact of Galaxies on the Circumgalactic Medium Metal Enrichment at $z > 6$ Using the JWST and VLT,* ApJL, 963, L28 (2024).
8. Ma, K., et al., (including **Wu, Y.**), *MAMMOTH-Subaru. V. Effects of Cosmic Variance on Lyα Luminosity Functions at $z = 2.2-2.3$,* ApJ, 961, 102 (2024).
9. Zhang, H., et al., (including **Wu, Y.**), *MAMMOTH-Subaru. III. Lyα Halo Identified by Stacking 3300 Lyα Emitters at $z = 2.2-2.3$,* ApJ, 961, 63 (2024).
10. Li, M., et al., (including **Wu, Y.**), *The Mass-Metallicity Relation of Dwarf Galaxies at Cosmic Noon from JWST Observations,* ApJL, 955, L18 (2023).
11. Zhang, S., et al., (including **Wu, Y.**), *Revealing the Gas Recycling in the Circumgalactic Medium (CGM) Utilizing a Luminous Lyα Nebula around a Type II Quasar at $z = 2.6$ with the Keck Cosmic Web Imager (KCWI),* ApJ, 952, 124 (2023).
12. Yang, J., et al., (including **Wu, Y.**), *A SPectroscopic Survey of Biased Halos in the Reionization Era (ASPIRE): A First Look at the Rest-frame Optical Spectra of $z > 6.5$ Quasars Using JWST,* ApJL, 951, L5 (2023).
13. Wang, F., et al., (including **Wu, Y.**), *A SPectroscopic Survey of Biased Halos in the Reionization Era (ASPIRE): JWST Reveals a Filamentary Structure around a $z = 6.61$ Quasar,* ApJL, 951, L4 (2023).

14. Li, J., et al., (including **Wu, Y.**), *The SUPERCOLD-CGM Survey. I. Probing the Extended CO(4-3) Emission of the Circumgalactic Medium in a Sample of 10 Enormous Lyα Nebulae at $z \sim 2$,* ApJ, 950, 180 (2023).
15. Zhang, S., et al., (including **Wu, Y.**), *Inspiraling streams of enriched gas observed around a massive galaxy 11 billion years ago,* Science, 380, 494 (2023).
16. Lin, X., et al., (including **Wu, Y.**), *Metal-enriched Neutral Gas Reservoir around a Strongly Lensed Low-mass Galaxy at $z = 4$ Identified by JWST/NIRISS and VLT/MUSE,* ApJL, 944, L59 (2023).
17. Zhang, H., et al., (including **Wu, Y.**), *MAMMOTH-Subaru IV. Large Scale Structure and Clustering Analysis of Lyα Emitters and Lyα Blobs at $z = 2.2 - 2.3$,* arXiv e-prints, arXiv:2301.07359 (2023).
18. Li, J., et al., (including **Wu, Y.**), *Massive Molecular Outflow and 100 kpc Extended Cold Halo Gas in the Enormous Lyα Nebula of QSO 1228+3128,* ApJL, 922, L29 (2021).