

Shiwu Zhang

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EDUCATION & EXPERIENCE

- **Zhejiang Lab, China** Dec. 2023 - Dec. 2025
Postdoc in Astronomy
Hosts: Donghui Quan
- **Tsinghua University, China** Sep. 2018 - Oct. 2023
PhD in Astronomy
Thesis: Studying the CGM Through Observations, Cosmological Simulations, and Semi-analytic Model
Advisor: Prof. Zheng Cai
- **Guangxi University, China** Sep. 2014 - Jun. 2018
BS in Physics

RESEARCH INTERESTS

I am interested in exploring the ecosystem of galaxies and their gas environment at high redshifts ($z \geq 2$). Currently, my research mainly focuses on unveiling the properties of the circumgalactic medium (CGM) and its connection to the host galaxy and supermassive black hole through observations and simulations to show how they grow. Broadly, my research interests include but are not limited to, the imaging/spectroscopic surveys to not only study the evolution of mass-assembly history of galaxies but also explore the potential of these surveys to revolutionize cosmology.

AWARDS

- **Excellent Doctoral Thesis** (*The only graduate student in the department this year*) 2024
- **Fellowship of China National Postdoctoral Program for Innovative Talents** (*top ten percent*) 2024
- **President Scholarship** (*Highest Student Award*) 2018
- **Outstanding Graduates** 2018

PUBLICATION LIST

3 as the first author, 10 contributed work, 224 total citations, and h-index=7 from ADS.

Leading Author:

- **Zhang, S.** & Cai, Z., et al., *Inspiring streams of enriched gas observed around a massive galaxy 11 billion years ago*, 2023a, *Science*, 380, 494
- **Zhang, S.** & Cai, Z., et al., *Revealing the Gas Recycling in the Circumgalactic Medium (CGM) Utilizing a Luminous Ly α Nebula around a Type-II Quasar at $z = 2.6$ with the Keck Cosmic Web Imager (KCWI)*, 2023b, *ApJ*, 952, 124
- **Zhang, S.** & Cai, Z., et al., *Testing the AGN unified model with simulated emission lines from Circumgalactic Medium (CGM) at $z = 2 - 3$* , *MNRAS*, 541, 3675

Contributed work:

- Wu, Y., Cai, Z., et al. (incl. **Zhang, S.**), *A [C II] 158 μm emitter associated with an OI absorber at the end of the reionization epoch*, 2021, *Nature Astronomy*, 5, 1110
- Li, J., Emonts, B., et al. (incl. **Zhang, S.**), *Massive Molecular Outflow and 100 kpc Extended Cold Halo Gas in the Enormous Ly α Nebula of QSO 1228+3128*, 2021, *ApJL*, 922, L29
- Wu, Y., Cai, Z., et al. (incl. **Zhang, S.**), *The Identification of a Dusty Multiarm Spiral Galaxy at $z = 3.06$ with JWST and ALMA*, 2023a, *ApJL*, 942, L1
- Guo, J., Wu, J., et al. (incl. **Zhang, S.**), *Bubble in the Whale: Identifying the Optical Counterparts and Extended Nebula for the Ultraluminous X-Ray Sources in NGC 4631*, 2023, *ApJ*, 946, 72
- Li, J., Vargas, C., J., et al. (incl. **Zhang, S.**), *Circumgalactic Ly α Nebulae in Overdense Quasar Pair Regions Observed with the Palomar Cosmic Web Imager*, 2023, *ApJ*, 952, 137
- Li, M., Cai, Z., et al. (incl. **Zhang, S.**), *The Mass-Metallicity Relation of Dwarf Galaxies at Cosmic Noon from JWST Observations*, 2023, *ApJL*, 955, L18
- Wu, Y., Cai, Z., et al. (incl. **Zhang, S.**), *Searching for CII Emission from the First Sample of $z \sim 6$ OI Absorption-associated Galaxies with the Atacama Large Millimeter/submillimeter Array*, 2023b, *ApJ*, 958, 16
- Li, M., Zhang, H., et al. (incl. **Zhang, S.**), *MAMMOTH-Subaru. II. Diverse Populations of Circumgalactic Ly α Nebulae at Cosmic Noon*, 2024, *ApJS*, 275, 27
- Wang, X., Cheng, C., et al. (incl. **Zhang, S.**), *A Strong HeII $\lambda 1640$ Emitter with an Extremely Blue UV Spectral Slope at $z = 8.16$: Presence of Population III Stars?*, 2024, *ApJL*, 967, L42
- Li, Z., Cai, Z., et al. (incl. **Zhang, S.**), *A 13-Billion-Year view of Galaxy Growth: Metallicity Gradient Evolution from the Local Universe to $z = 9$ with JWST and Archival Surveys*, 2025, Submitted to *ApJS*

TALK & PRESENTATIONS (SELECTED)

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- **Guo Shoujing Conference** Nov. 2020, China
Contributed talk: *Using Emission and Absorption to Study the High Redshift Circumgalactic Medium (CGM)*
 - **Workshop of Galaxy Star Formation and Nuclear Activity** Dec. 2020, China
Invited talk: *Studying the High redshift CGM-galaxy Ecosystem through the Emission and Absorption*
 - **X-talk & DOA Lunch Talk** Jun. 2023, China
Invited talk: *Studying the Circumgalactic Medium (CGM) Through Observations, Cosmological Simulations, and Semi-analytic Model*
 - **Astronomical Computing Workshop** Mar. 2024, China
Invited talk: *Studying the Circumgalactic Medium (CGM) and galaxy Ecosystem through the Extended Emission (SCAME³)*
 - **Chinese Space Station Telescope (CSST) Annual Conference** May 2024, China
Invited talk: *Studying the metal-enriched Circumgalactic Medium (CGM) through the Extended Emissions and CSST prospect*

SKILLS

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- **Observational data reduction:** Keck/KCWI optical IFS; VLT/MUSE optical IFS; LBT/LBC optical imaging
 - **Simulation data analysis:** IllustrisTNG; FIRE; RASCAS; YT-project
 - **Programming Language:** Python (Fluent); [Shell, C] (Basic)

OUTREACH & SERVICE

- I co-organized the Galaxy and Cosmology workshop at DoA, Tsinghua University Mar. 2022 - Jun. 2022
- I am a member of the DESI workshop Mar. 2021 - present
- I co-organized the Student Seminar at DoA, Tsinghua University Sep. 2019 - Dec. 2019

MENTORING & TEACHING EXPERIENCE

- Teaching Assistant in Advanced Observational Astrophysics for Graduate 2019 Spring