



# ZIHAO LI (黎子豪)

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## Education

### Tsinghua University

*M.sc. in Astronomy.* GPA: 3.85/4.00

*Advisor: Prof. Zheng Cai*

Sep. 2021 –

Beijing, China

### Sichuan University

*B.Eng. in Aerospace Engineering.* GPA: 3.80/4.00 rank: 2/28

*Honors Degree in Top-notch program.*

Sep. 2017 – Jun. 2021

Chengdu, China

### University of California, Berkeley

*Visiting Student in Summer Sessions (Astronomy).* GPA: 4.00/4.00

Jul. 2019 – Aug. 2019

Berkeley, USA

## Relevant Coursework

- Physical Cosmology
- Observational Astrophysics
- Galactic Physics
- High Energy Astrophysics
- Computational Physics
- General Astronomy

## Research Interests & Experience

- (Spatially resolved) metal enrichment of high- $z$  galaxies.
- Environmental dependence of galaxy formation and evolution.
- Probe large scale structure through IGM tomography.
- CGM stacking using DESI.
- Data reduction for JWST NIRCам/NIRISS WFSS.
- Member of JWST ASPIRE data team.
- Member of JWST MAGNIF data team.

## Honors & Awards

- 1<sup>st</sup> Scholarship for Comprehensive Performance (10k CNY) | Tsinghua Univ. 2022
- Award for Excellent Thesis | National level in Aeronautics & Astronautics 2021
- MITACS Research Fellow in Astronomy (\$6k, cancelled due to COVID) | Univ. of Victoria 2020
- 1<sup>st</sup> Scholarship for Academic Performance | Sichuan Univ. 2020
- Summer Abroad Subsidy (10k CNY) | Sichuan Univ. 2019
- 1<sup>st</sup> Scholarship of China Space Foundation (8k CNY) | Sichuan Univ. 2018
- 1<sup>st</sup> Scholarship for Comprehensive Performance | Sichuan Univ. 2018

## Publications

### 1st/2nd Author Papers:

- Li, Z., Cai, Z., et al. Cosmic evolution of galaxies' chemical abundance gradients: mode transitions of galaxy formation. 2023, to be submitted
- Li, Z., Cai, Z., et al. A SPectroscopic survey of biased halos In the Reionization Era (ASPIRE): First Look at the Metal Enrichment and its Environmental Effect at  $z \approx 5 - 7$  in QSO fields with JWST. In Prep
- Li, Z., Cai, Z., et al. MAGNIF: A Tentative Lensed Rotating Disk at  $z = 8.34$  detected by JWST NIRCам WFSS with Dynamical Forward Modeling. 2023, submitted to ApJL, [arXiv:2310.09327](https://arxiv.org/abs/2310.09327)
- Li, Z., Wang, X., Cai, Z., et al. First Census of Gas-phase Metallicity Gradients of Star-forming Galaxies in Overdense Environments at Cosmic Noon. 2022, [ApJL, 929, L8](#)
- Wang, X., Li, Z., Cai, Z., et al. The Mass–Metallicity Relation at Cosmic Noon in Overdense Environments: First Results from the MAMMOTH–Grism HST Slitless Spectroscopic Survey. 2022, [ApJ, 926, 70](#)

- **Li, Z.**, Horowitz, B. and Cai, Z. Improved Ly $\alpha$  Tomography Using Optimized Reconstruction with Constraints on Absorption (ORCA). 2021, [ApJ, 916, 20](#)

### Papers with Significant Contribution:

- Wu, Y., ..., **Li, Z.** et al. The Identification of a Dusty Multiarm Spiral Galaxy at  $z = 3.06$  with JWST and ALMA. 2023, [ApJL, 942, L1](#) ([Press release](#))
- Lin, X., ..., **Li, Z.** et al. Metal-enriched Neutral Gas Reservoir around a Strongly Lensed Low-mass Galaxy at  $z = 4$  Identified by JWST/NIRISS and VLT/MUSE. 2023, [ApJL, 944, L59](#)
- Li, M., ..., **Li, Z.** et al. The Mass-Metallicity Relation of Dwarf Galaxies at the Cosmic Noon in the JWST Era. 2023, [ApJ, 955L, 18L](#)

### Other Contributing Author Papers:

- Wang, F., ..., **Li, Z.** et al. A SPectroscopic survey of biased halos In the Reionization Era (ASPIRE): JWST Reveals a Filamentary Structure around a  $z = 6.61$  Quasar. 2023, [ApJL, 951, L4](#) ([Press release](#))
- Yang, J., ..., **Li, Z.** et al. 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. 2023, [ApJL, 951, L5](#)

Full list in [ADS](#).

### Talks

- May. 2023. “*The Metal-enrichment of Low Mass Galaxies from cosmic dawn to noon ( $z \sim 2 - 7$ ) in the JWST Era*”, contributed talk at Chinese Astronomical Society Guoshoujing Symposium on Galaxies and Cosmology. (Huangshan, China)
- Mar. 2023. “*Research progress with HST/JWST slitless spectrograph and science preparation for CSST*”, contributed talk at China Space Station Telescope Conference 2023. (Huairou, China)

### Observing Proposals

#### Principle-Investigator:

- JWST-GO-5638 (10 hours, submitted): Resolving galaxy kinematics and chemical enrichment in the  $z > 8$  group environment

#### Co-Investigator:

- [JWST-GO-2883](#), PI Fengwu Sun: MAGNIF: Medium-band Astrophysics with the Grism of NIRCам in Frontier Fields.
- [JWST-GO-3325](#), PI Feige Wang: Mapping the Most Extreme Protoclusters in the Epoch of Reionization.
- [HST-GO-17159](#), PI Xin Wang: Escaping Lyman Continuum from the Overdensities of Extreme Emission Line Galaxies at  $z \sim 2.2$ .

### Teaching experience

- Teaching Assistant of *Advanced Observational Astrophysics* at Tsinghua University. Spring 2023

### Outreach Activities

- Director of Equipment Department of Sichuan University Astronomy Society. 2018–2019
- Vice captain/pilot/mechanician of Sichuan University Students Aeromodel Team. 2018–2019

### References

**Prof. Zheng Cai**

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**Prof. Xin Wang**

✉ [xwang@ucas.ac.cn](mailto:xwang@ucas.ac.cn)

**Dr. Benjamin Horowitz**

✉ [bhorowitz@berkeley.edu](mailto:bhorowitz@berkeley.edu)

Department of Astronomy, Tsinghua University

National Astronomical Observatories, Chinese Academy of Sciences

Computational Cosmology Center, Lawrence Berkeley National Lab