Zechang Sun

szc22@mails.tsinghua.edu.cn — Zechang Sun — +86-13230710781
My Website — @ZechangS

FIELDS OF INTEREST

- Probing the matter content of the Universe through weak gravitational lensing;
- Understanding galaxy formation, large-scale structure, groups and clusters of galaxies;
- Advancing astronomical research via machine learning and sophisticated statistical methods.

EDUCATION

2022 - present Doctor of Philosophy (*Astronomy*) **Tsinghua University**
– Study galaxy formation, galaxy evolution, and cosmology

2018 - 2022 Bachelor's Degree (*Mathematics and Physics*) **Tsinghua University**
– Grade Point Average: 3.82/4.0
– Minor in data science

PROJECTS

SpecViewer Link to Demo

An open-source project aiming to build a user-friendly and intuitive visualization toolkit for astronomers to analyze spectral data.

QFA Link to Demo

An unsupervised and probabilistic model for quasar spectrum modeling, which can be used for quasar continuum inference, out-of-distribution detection, and, studying quasar population evolution.

dla_cnn Link to Demo

Deep learning algorithm for damped Lyα system detection in quasar spectra, part of DESI Lyα working group pipeline.

HIGHTLIGHT SERVICE

Co-Principal Investigator in the UniverseTBD Project Link to UniverseTBD

Main organizer of ML4Astro Student Seminar DoA, Tsinghua University

Made Chinese translations for *5000 Eyes - Mapping the Universe with DESI* Link to Vedio

ADVISED STUDENTS

Anning Gao Undergraduate Student in Tsinghua, Applying for PhD

Scholarships

Tsinghua Scholarship	Oct 2023
Qisun Ye Nomination Scholarship	Jun 2022
National Astronomical Observatories of China Scholarship	Nov 2021
Tsinghua Scholarship	Oct 2020
Tsinghua Scholarship	Oct 2019

Skills

Languages	Python, C/C++, SQL
Human Languages	Chinese, English
Developer Tools	Jupyter Notebooks, Git, VS Code

First Author Publications

Sun, Zechang et al. (2022). *An Unsupervised Learning Approach for Quasar Continuum Prediction*. arXiv: 2207.02788 [astro-ph.CO].

Sun, Zechang, Joshua S. Speagle, et al. (Oct. 2023). "Zephyr : Stitching Heterogeneous Training Data with Normalizing Flows for Photometric Redshift Inference". In: *arXiv e-prints*, arXiv:2310.20125, arXiv:2310.20125. DOI: 10.48550/arXiv.2310.20125. arXiv: 2310.20125 [astro-ph.IM].

Sun, Zechang et al. (Nov. 2023). "Quasar Factor Analysis-An Unsupervised and Probabilistic Quasar Continuum Prediction Algorithm with Latent Factor Analysis". In: *The Astrophysical Journal Supplement Series* 269.1, 4, p. 4. DOI: 10.3847/1538-4365/acf2f1. arXiv: 2211.11784 [astro-ph.CO].

Significant Contributions

Wang, Ben et al. (Jan. 2022). "Deep Learning of DESI Mock Spectra to Find Damped Lyα Systems". In: *arXiv e-prints*, arXiv:2201.00827, arXiv:2201.00827. DOI: 10.48550/arXiv.2201.00827. arXiv: 2201.00827 [astro-ph.GA].

Li, Mingyu et al. (Sept. 2023). "The Mass-Metallicity Relation of Dwarf Galaxies at Cosmic Noon from JWST Observations". In: *The Astrophysical Journal Letters* 955.1, L18, p. L18. DOI: 10.3847/2041-8213/acf470. arXiv: 2211.01382 [astro-ph.GA].

Nguyen, Tuan Dung et al. (2023). *AstroLLaMA: Towards Specialized Foundation Models in Astronomy*. arXiv: 2309.06126 [astro-ph.IM].

Zou, Siwei et al. (Feb. 2023). "DESI survey validation data in the COSMOS/HSC field: Cool gas trace main sequence star-forming galaxies at the cosmic noon". In: *arXiv e-prints*, arXiv:2302.13357, arXiv:2302.13357. DOI: 10.48550/arXiv.2302.13357. arXiv: 2302.13357 [astro-ph.GA].

Other Contributions

DESI Collaboration Et Al (2023). *The Early Data Release of the Dark Energy Spectroscopic Instrument*. DOI: 10.5281/ZENODO.7964161. URL: https://zenodo.org/record/7964161.