Chi Zhang

PhD Candidate
Date of birth: 01/05/2000
Nationality: China

Purple Mountain Observatory, Chinese Academy of Sciences, Nanjing 210023, PRC
School of Astronomy and Space Science, University of Science and Technology of China, Hefei 230026, PRC
chizhangpmo@gmail.com | https://inspirehep.net/authors/2657553

I am a Ph.D. candidate at Purple Mountain Observatory (PMO) and the University of Science and Technology of China (USTC), supervised by **Prof. Yi-Zhong Fan** and **Prof. Yue-Lin Sming Tsai**. I spent one year as a visiting student at SISSA under the supervision of **Prof. Matteo Viel**. My research focuses on **the nature of dark matter**, combining cosmological survey data with numerical simulations. I program primarily in Python and C.

Education

Purple Mountain Observatory, Chinese Academy of Sciences — *Nanjing, China*
PhD in Astrophysics — *2021.09 - present*
- Supervisor: Prof. Yi-Zhong Fan and Prof. Yue-Lin Sming Tsai
- Expected graduation date: June 2026

Scuola Internazionale Superiore di Studi Avanzati (SISSA) — *Trieste, Italy*
Visitor — *2024.09 - 2025.09*
- Supervisor: Matteo Viel
- Project: The gas distributions inside and around haloes in AIDA-TNG simulations

Inner Mongolia University — *Hohhot, China*
Degree in Physics — *2017.09 - 2021.06*
- Supervisors: Chengjun Zhu and Yi-Zhong Fan
- Thesis title: Search for gamma-ray line features with Fermi-LAT Pass 8 data in galaxy clusters

Publications — First & Corresponding Author

[1] **Lei, Zu and Chi, Zhang**, Hou-Zun Chen, Wei Wang, et al. "Exploring mirror twin Higgs cosmology with present and future weak lensing surveys". In: *JCAP* 08 (2023), p. 023. DOI: 10.1088/1475-7516/2023/08/023. arXiv: 2304.06308 [astro-ph.CO].

[2] **Chi, Zhang**, Lei Zu, Hou-Zun Chen, et al. "Weak lensing constraints on dark matter-baryon interactions with N-body simulations and machine learning". In: *JCAP* 08 (2024), p. 003. DOI: 10.1088/1475-7516/2024/08/003. arXiv: 2402.18880 [astro-ph.CO].

[3] **Chi Zhang**, Enrico Garaldi, Giulia Despali, et al. "The gas distributions inside and around haloes in AIDA-TNG simulations". to be submitted. 2025.

[4] Lei Zu, William Giarè, **Chi, Zhang**, et al. "A solution to the S_8 tension through neutrino–dark matter interactions". In: *Nature Astronomy* (Jan. 2026). DOI: 10.1038/s41550-025-02733-1. arXiv: 2501.13785 [astro-ph.CO].

Publications — Contributed

[5] Eleonora Di Valentino et al. "The CosmoVerse White Paper: Addressing observational tensions in cosmology with systematics and fundamental physics". In: *Phys. Dark Univ.* 49 (2025), p. 101965. DOI: 10.1016/j.dark.2025.101965. arXiv: 2504.01669 [astro-ph.CO].

[6] Lei Lei et al. "Black holes as the source of dark energy: A stringent test with high-redshift JWST AGNs". In: *Sci. China Phys. Mech. Astron.* 67.2 (2024), p. 229811. DOI: 10.1007/s11433-023-2233-2. arXiv: 2305.03408 [astro-ph.CO].

[7] Yao-Yu Li, **Chi, Zhang**, Ziwei Wang, et al. "Primordial magnetic field as a common solution of nanohertz gravitational waves and the Hubble tension". In: *Phys. Rev. D* 109.4 (2024), p. 043538. DOI: 10.1103/PhysRevD.109.043538. arXiv: 2306.17124 [astro-ph.HE].

[8] Lei Zu, **Chi, Zhang**, Yao-Yu Li, et al. "Mirror QCD phase transition as the origin of the nanohertz Stochastic Gravitational-Wave Background". In: *Sci. Bull.* 69 (2024), pp. 741–746. DOI: 10.1016/j.scib.2024.01.037. arXiv: 2306.16769 [astro-ph.HE].

Awards, Fellowships, & Grants

2024 **China Scholarship Council scholarship**, China Scholarship Council *€ 16,200*
Merit Student, Purple Mountain Observatory

2021 **Excellent Student Cadre**, Inner Mongolia university

Presentations

Invited Talks

08/21/2024, *Exploring Non-gravitational Interactions of Dark Matter by Weak Lensing*. NAOC, Beijing, China.

16/01/2024, *Weak Lensing Constraints on Dark Matter-Baryon Interactions with N-Body Simulations and Machine Learning*. Chongqing University, Chongqing, China.

Contributed Talks

17/11/2025, The Gas distribution inside and around haloes in AIDA-TNG simulations, Shanghai, China.

11/05/2024, Weak Lensing Constraints on Dark Matter-Baryon Interactions with N-Body Simulations and Machine Learning, Soochow, China. **Outstanding Report Award**

29/12/2023, Exploring Dark Matter Interacting with Baryon by Weak Lensing and N-body Simulation, Nanjing, China.

01/12/2023, Exploring Dark Matter Interacting with Baryon by Weak Lensing and N-body Simulation, SYSU, Zhuhai, China.

Contributed Posters

02/06/2024, Weak Lensing Constraints on Dark Matter-Baryon Interactions with N-Body Simulations and Machine Learning, Nanjing, China. **Outstanding Performance Award**

02/06/2023, Exploring Mirror Twin Higgs Cosmology with Present and Future Weak Lensing Surveys, TDLI, Shanghai, China. **Outstanding Performance Award**

Academic references

Prof. Yi-Zhong Fan *Nanjing, China*
Purple Mountain Observatory, Chinese Academy of Science
Email: yzfan@pmo.ac.cn

Prof. Matteo Viel *Trieste, Italy*
Scuola Internazionale Superiore di Studi Avanzati (SISSA)
Email: viel@sissa.it

Prof. Enrico Garaldi *Chiba, Japan*
Kavli Institute for the Physics and Mathematics of the Universe, University of Tokyo
Email: egaraldi@ipmu.jp

Prof. Giulia Despali *Bologna, Italy*
Department of Physics and Astronomy, University of Bologna
Email: giulia.despali@unibo.it