

Haihao Shi

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EDUCATION

MSc Astrophysics (Particle Astrophysics), University of Chinese Academy of Sciences, School of Astronomy and Space Science; 2023–2026

- Joint Program between Xinjiang Astronomical Observatory and Yunnan Observatories, Chinese Academy of Sciences (Advisors: Prof. Dr. Guoliang Lü and Prof. Dr. Xuefei Chen)

BSc Physics, East China University of Technology, School of Science, Department of Physics; 2019–2023

- Undergraduate Thesis: *Direct Detection of Weakly Interacting Massive Particle Dark Matter*

MANUSCRIPTS UNDER REVIEW

- [1]. Shi, H., Huang, Z., Yan, Q., Zhou, J., Lü, G., & Chen, X. (2025). Application of interpretable data-driven methods for the reconstruction of supernova neutrino energy spectra following fast neutrino flavor conversions. [arXiv preprint arXiv:2507.09632](#).

PUBLICATIONS

- [1]. Shi, H., Zhou, J., Huang, Z., Lü, G., & Chen, X. (2025). Dark Matter (S) pins the Planet. *Accepted by Journal of Cosmology and Astroparticle Physics(JCAP)*, [arXiv:2503.17206](#).
- [2]. Shi, H., Huang, Z., Zhou, J., Lü, G., & Chen, X. (2025). A Core-Collapse Supernova Neutrino Parameterization with Enhanced Physical Interpretability. *Accepted by Astrophysical Journal Supplement Series(APJS)*, [arXiv:2511.16631](#)
- [3]. Shi, H., Huang, Z., Yan, Q., Li, J., Lü, G., & Chen, X. (2025). Hunting Hidden Axion Signals in Pulsar Dispersion Measurements with Machine Learning. *Accepted by Astrophysical Journal(APJ)*, [arXiv preprint arXiv:2505.16562](#).
- [4]. Huang, Z., Shi, H., Liu, Z., & Wang, N. (2025). An Interpretable AI Framework to Disentangle Self-Interacting and Cold Dark Matter in Galaxy Clusters: The CKAN Approach. *The Astronomical Journal (AJ)* **170**, 263 (2025). [doi:10.3847/1538-3881/ae0476](#). [arXiv:2509.06788](#).
- [5]. Di, H., Shi, H., & Yi, Z. (2025). Detection of dilute axion stars with stimulated decay. *Physical Review D*, **111**(2), 023011.
- [6]. Di, H., Yi, Z., Shi, H., & Gong, Y. (2025). Detecting dilute axion stars constrained by fast radio bursts in the Solar System via stimulated decay. *The European Physical Journal C*, **85**(5), 555.
- [7]. Di, H., & Shi, H. (2023). Can planet 9 be an axion star?. *Physical Review D*, **108**(10), 103038.
- [8]. Di, H., Shi, H., & Peng, Y. (2023). The influence of dark matter on the motion of asteroids. *Modern Physics Letters A*, **38**(07), 2350043.

EXPERIENCE

University of Chinese Academy of Sciences 2025 Graduate Student Academic Forum: Astronomy Interdisciplinary Sub-Forum; Nov. 26, 2025

- Oral Presentation: Two Applications of Machine Learning in Astrophysics: Supernova Neutrino Spectrum Reconstruction and Axion Searches in Pulsar Data

The 2025 Annual Meeting of the Chinese Astronomical Society ; Oct. 31–Nov. 4, 2025

- Oral Presentation: *Application of Interpretable Data-Driven Methods for the Reconstruction of Supernova Neutrino Energy Spectra Following Fast Neutrino Flavor Conversions*

The 10th Square Kilometre Array (SKA) Summer School; Sept. 2025

- Excellence in Practice Award

ICESUN Summer school 2025: Binary Star and Compact Objects; Aug. 2025

- Teaching Assistant for Prof. Zhuo Chen

11th Youth Astronomical Forum of the Chinese Astronomical Society; Aug. 2025

- Poster Presentation: *Application of Interpretable Data-Driven Methods for the Reconstruction of Supernova Neutrino Energy Spectra Following Fast Neutrino Flavor Conversions*

2024 Graduate Summer School on Galaxy Science, China Space Station Telescope (CSST); July 2024

- Participant

Gravitational Wave Data Exploration: Practical Training in Programming and Analysis; Nov. 2023 – Jan. 6, 2024

- ["Can you find the GW signals?" Kaggle Data Science Competition \(Hackathon\) – 5th Place](#)

2023 Advanced Summer School on Theoretical Physics — Precision Measurement and Probes of Gravitational Properties; Aug. 2023


- Fully Funded Participant

SKILLS AND INTERESTS

Coding Skills: Knowledge in Python and Mathematica

Languages: English (conversational), Mandarin Chinese (native), German (beginner)

OTHER EXPERIENCES (BEYOND ASTRONOMY)

Eighth place in the team category of the 2021 undergraduate football tournament. 

[First Prize in the 6th China Undergraduate Physics Experiment Competition in 2020.](#) 

Third Prize in the 2019 Top Ten Singers Competition of the School of Science. 