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.*

[2]. **Shi, H.**, Zhou, J., Huang, Z., Lü, G., & Chen, X. (2025). Dark Matter (S) pins the Planet. *arXiv preprint arXiv:2503.17206*.

PUBLICATIONS

[1]. **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*, arXiv:2511.16631

[2]. **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*, *arXiv preprint arXiv:2505.16562*.

[3]. 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.*

[4]. Di, H., **Shi, H.**, & Yi, Z. (2025). Detection of dilute axion stars with stimulated decay. *Physical Review D*, *111*(2), 023011.

[5]. 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.

[6]. Di, H., & **Shi, H.** (2023). Can planet 9 be an axion star?. *Physical Review D*, *108*(10), 103038.

[7]. 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.