Hongzhe Zhou **hzzhou@sspu.edu.cn** **November, 2025**

Personal Information Born in 1992 in Shanghai, China

Research Interests Theoretical and computational astrophysics; plasma astrophysics of stars, galaxies, accretion engines, cosmic magnetic fields, and planetary atmospheres; astrophysical turbulence

Education

University of Rochester	Ph.D. (Theoretical Astrophysics; advisor: Eric G. Blackman)	2020
University of Rochester	M.A. (Theoretical Astrophysics)	2017
Fudan University	B.S. (Physics; advisor: Lingyan Hung)	2015

Professional Appointments

Associate Professor	Shanghai Polytechnic University	2025-present
Siyuan Postdoctoral Fellowship	TDLI, SJTU	2022-2025
Nordita Postdoctoral Fellowship	Nordita	2020-2022

Grants

Qimeng Project, Shanghai Polytechnic University. PI. 2026
Young Scientists Fund of the National Natural Science Foundation of China. PI. 2025
General funding from the China Postdoctoral Science Foundation. PI. 2023
Overseas Postdoctoral Talent Introduction Program 2022

Academic activities

Conference Organizer
Co-organizer of Nordita Winter School 2022 - Waves in Astrophysics, Nordita 2022
Undergraduate research at Fudan University 2014-2015
Holographic entropy in a topologically massive gravity theory. Advisor: Lingyan Hung
Laboratory work on electron-beam evaporation sources. Advisor: Donglai Feng

Fellowships and Awards

University of Rochester
Horton Fellowship (Laboratory for Laser Energetics) 2017-2020
Okubo Prize 2017
Fudan University
Honors Student Award in Physics, National Top Talent Undergraduate Training Program 2015
Second Prize of the Scholarship for Outstanding Students 2012-2014
Scholarship for Freshman 2011

Teaching

Shanghai Polytechnic University
College Physics B (Electricity and Magnetism), College Physics C (Lab Experiments), Introduction to Applied Physics
Department of Astronomy, Stockholm University
Astrophysical Magnetohydrodynamics (co-lecturer) Spring 2022
Department of Physics and Astronomy, University of Rochester
Special and General Relativity (Substitute Lecturer) Fall 2018
Teaching assistant: Electricity and Magnetism, Mechanics, Gravity 2015-2016

Computer Programming

Pencil Code (Fortran; finite difference; MHD): Developer and Code Owner
BHAC (Fortran; finite volume; GRMHD): Developer and user
Vernalis (Fortran; pseudo-spectral; quantum mechanics/MHD): Independent developer

Refereeing Monthly Notices of the Royal Astronomical Society, the Astrophysical Journal, Astronomy & Astrophysics, Galaxies, Journal of Plasma Physics

Refereed Publications

13. **Zhou, H.**, Yosuke Mizuno and Zhenyu Zhu, 2025. Subgrid Mean-field Dynamo Model with Dynamical Quenching in General Relativistic Magnetohydrodynamic Simulations. *submitted to ApJ.*

12. **Zhou, H.** and Lai, D., 2024. Understanding the UV/Optical Variability of AGNs through Quasi-Periodic Large-scale Magnetic Dynamos. *arXiv 2411.12953* .

11. **Zhou, H.** and Jingade, N., 2024. Correlation times of velocity and kinetic helicity fluctuations in nonhelical hydrodynamic turbulence. *Journal of Fluid Mechanics, 2024;1000:A17.*

10. **Zhou, H.** and Blackman, E. G., 2024. Helical dynamo growth and saturation at modest versus extreme magnetic Reynolds numbers. *Physical Review E 109, 015206.*

9. **Zhou, H.**, 2024. Helical and nonhelical large-scale dynamos in thin accretion discs. *Monthly Notices of the Royal Astronomical Society, 527(2), pp.3018–3028.*

8. Brandenburg, A., **Zhou, H.**, and Sharma, R., 2022. Batchelor, Saffman, and Kazantsev spectra in galactic small-scale dynamos. *Monthly Notices of the Royal Astronomical Society, 518(3), pp.3312–3325.*

7. **Zhou, H.**, Sharma, R., and Brandenburg, A., 2022. Scaling of the Saffman helicity integral in decaying magnetically-dominated turbulence. *Journal of Plasma Physics, 88, p. 905880602.*

6. **Zhou, H.** and Blackman, E. G., 2021. On the shear-current effect: toward understanding why theories and simulations have mutually and separately conflicted. *Monthly Notices of the Royal Astronomical Society, 507(4), pp.5732–5746.*

5. **Zhou, H.** and Blackman, E. G., 2021. Influence of inhomogeneous stochasticity on the falsifiability of mean-field theories and examples from accretion disc modeling. *Monthly Notices of the Royal Astronomical Society, 507(2), pp.2735–2743.*

4. **Zhou, H.** and Blackman, E. G., 2018. Calculating turbulent transport tensors by averaging single-plume dynamics and application to dynamos. *Monthly Notices of the Royal Astronomical Society: Letters, 483(1), pp.L104-L108.*

3. **Zhou, H.**, Blackman, E. G. and Chamandy, L., 2018. Derivation and precision of mean field electrodynamics with mesoscale fluctuations. *Journal of Plasma Physics, 84(3), p. 735840302.* Selected by the Editorial Board of the JPP as one of the "Featured Articles".

2. **Zhou, H.** and Blackman, E. G., 2017. Some consequences of shear on galactic dynamos with helicity fluxes. *Monthly Notices of the Royal Astronomical Society, 469(2), pp.1466-1475.*

1. Cheng, L., Hung, L. Y., Liu, S. N. and **Zhou, H.Z.**, 2016. First law of entanglement entropy in topologically massive gravity. *Physical Review D, 94(6), p.064063.*