

Han Wang 王晗

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Employment

Kavli Institute for Astronomy and Astrophysics, Peking University (KIAA-PKU) **Beijing, China**
Postdoctoral researcher *Jul 2025 - present*

- Postdoctoral Supervisor: Lijing Shao (邵立晶) and Xian Chen (陈弦)

Education

Sun Yat-sen University (SYSU) **Zhuhai, China**
Ph.D. in Astronomy *Sep 2020 - Jun 2025*

- Thesis: Space-based Gravitational Wave Data Analysis of Stellar-mass Binary Black Holes: A Multi-band View
- Supervisor: Yi-Ming Hu (胡一鸣)

This thesis develops an end-to-end framework for detecting and characterizing stellar-mass binary black holes with space-based observatories, spanning data simulation, archival searches, and parameter estimation. It also investigates how orbital eccentricity can help distinguish their formation channels.

University of Portsmouth **Portsmouth, UK**
Visiting Ph.D. Student *Oct 2023 - Oct 2024*

- Supervisor: Ian Harry

Huazhong University of Science and Technology (HUST) **Wuhan, China**
B.S. in Physics *Sep 2016 - Jun 2020*

- Thesis: Analyses of Laser Propagation Noises for TianQin Gravitational Wave Observatory
- Supervisors: Yan Wang (王炎) and Wei Su (苏威)

This thesis analyzes existing magnetohydrodynamic simulation data to estimate laser-propagation noise caused by Earth's magnetospheric plasma in TianQin.

University of California, Berkeley **Berkeley, CA, USA**
Berkeley International Study Program *Jan 2019 - May 2019*

Selected Awards and Scholarships

Honors Graduate of SYSU <i>Top distinction awarded to the top 5% of graduates at SYSU</i>	2025
Outstanding Dissertation Award, School of Physics and Astronomy, SYSU <i>School-level distinction recognizing an outstanding doctoral dissertation, based on anonymous expert review</i>	2025
National Scholarship <i>A top national student honor recognizing academic excellence, leadership, and public service</i>	2024
State Scholarship Fund, China Scholarship Council <i>National scholarship awarded through competitive academic review to support a research visit, in this case to the University of Portsmouth</i>	Oct 2023 - Oct 2024
TianQin Jianxing Outstanding Postgraduate Scholarship <i>Endowed scholarship for outstanding postgraduates contributing to TianQin mission</i>	2022 & 2023
The Postgraduate Skills Competition of TianQin Research Center <i>Competition awards for gravitational-wave science outreach videos</i>	1 st in 2021 & 2 nd in 2022
Outstanding Graduate of HUST <i>Top honor awarded to graduating undergraduates at HUST</i>	2020

Merit Student of HUST
University-wide recognition for excellence in academic performance and public service

Outstanding Student Cadre of HUST
University-wide recognition for undergraduate leadership and service in student organizations

2019

2017 & 2018

Talks and Presentations

Invited Talks & Lectures:

TianQin Research Center for Gravitational Physics, Sun Yat-sen University, Zhuhai, China – Invited Talk	Sep 2026
Spring School on Space-Based Gravitational-Wave Data Simulation and Analysis, Shanghai, China – Invited Lectures	Apr 2026
2025 Young Scholars Academic Forum of the Liaoning Provincial Key Laboratory of Cosmology and Astrophysics, Shenyang, China – Invited Talk	Dec 2025
KIAA, Peking University, Beijing, China – Invited Talk	Apr 2025

Presentations:

Mini-Workshop on Scalar Fields in Astrophysics at KIAA-PKU, Beijing, China – Talk	Sep 2026
2nd New Horizons for Psi Workshop, Beijing, China – Contributed Talk	Aug 2026
2nd Sino-Europe Workshop on Lunar Gravitational Wave Detection, Dunhuang, China – Contributed Talk	Jul 2026
GWnext 2026, Beijing, China – Poster ; 1st Prize	Mar 2026
The 4th Jinghai Forum and Taiji Data Challenge Workshop, Shanghai, China – Contributed Talk	Jan 2026
Astronomy & Astrophysics Joint Postdoc Forum 2025 (PKU+THU), Beijing, China – Poster	Dec 2025
2 nd Graduate Academic Forum of the School of Physics and Astronomy (Gewu Forum), Zhuhai, China – Contributed Talk ; 1st Prize & Audience Choice Award	May 2025
2025 Annual Meeting of the Gravity and Relativistic Astrophysics Division of the Chinese Physical Society, Kunming, China – Contributed Talk	Apr 2025
245 th Meeting of the American Astronomical Society, National Harbor, MD, USA – Contributed Talk	Jan 2025
2024 Annual Meeting of the TianQin Research Center, Zhuhai, China – Contributed Talk ; Best Student Talk Award	Jan 2025
2024 Annual Meeting of the Chinese Astronomical Society, Hangzhou, China – Poster	Oct 2024
15 th LISA Symposium, Dublin, Ireland – Poster	Jul 2024
Faculty of Technology Research and Innovation Conference, Portsmouth, UK – Poster	Jun 2024
24 th BritGrav Meeting, London, UK – Contributed Talk	Apr 2024
1 st Symposium on Gravitational Wave Astronomy in the Audio Band, Zhuhai, China – Contributed Talk (remote)	Mar 2024
LISA Ground Segment Meet Up, Birmingham, UK – Talk	Jan 2024
2023 Annual Meeting of the Gravity and Relativistic Astrophysics Division of the Chinese Physical Society, Chongqing, China – Contributed Talk	Apr 2023
SYSU-PKU Bilateral Seminar on Gravitational Wave Astronomy, Zhuhai, China – Talk	Mar 2023
Research Tools and Techniques Seminar, Zhuhai, China – Tutorial	Dec 2021

Research Software

🔗 [TianQinSYSU/GWSpace](#) 🔗 – Lead Developer and Co-first Author

Open-source multi-mission science data simulator for space-based gravitational-wave observatories.

🔗 [HumphreyWang/pyEccentricFD](#) 🔗 – Developer and Maintainer

Python/C adaptation of LALSuite's EccentricFD waveform for space-based analyses, with Python bindings, harmonic-resolved outputs, and arbitrary-frequency evaluation.

🔗 [gwastro/pycbc](#) 🔗 & 🔗 [gwastro/sbank](#) 🔗 – Open-source Contributor

Professional Service and Outreach

Academic Service:

Member, KIAA-DoA Seminar Organizing Committee	May 2026 - present
Local Organizing Committee Member, 2nd Sino-Europe Workshop on Lunar Gravitational Wave Detection	Jul 2026
Organizer & Coordinator, KIAA Mini-Workshop on Frontiers in Gravitational Physics	Dec 2025

Outreach and Leadership Roles:

Outreach videos on gravitational waves [in Chinese] video 1 🔗 video 2 🔗	
Volunteer, Stargazing at Portsmouth Historic Dockyard 🔗	Jan 2024
Leader, Astronomy Enthusiasts Group of TianQin Research Center <i>Organized sidewalk astronomy observations and other outreach events.</i>	2020 - 2022
Lab Manager, Innovative Base for Physics Experiment of HUST <i>Managed lab planning, procurement, daily operations, and public outreach for a platform supporting undergraduate self-study and research in physics.</i>	2017 - 2018
Vice President, Astronomy Enthusiasts Association of HUST	2017 - 2018
Executive Committee Member, Astronomy Enthusiasts Association of HUST <i>Organized public observing sessions, stargazing trips, expert talks, livestreams of astronomical events, and astronomy lectures at local high schools.</i>	2016 - 2019

Teaching and Mentoring

Teaching Assistants:

Methods in Mathematical Physics – [Instructor: Jian-Dong Zhang (张建东)]	Fall 2022
Fundamentals of Physics II – [Instructor: Yi-Ming Hu (胡一鸣)]	Fall 2021
Thermodynamics and Statistical Physics – [Instructor: Jian-Wei Mei (梅健伟)]	Spring 2021

Publications

- Han Wang**, Lijing Shao. “Constraining dipole radiation with multiband gravitational waves from eccentric binary black holes”. In: *Phys. Rev. D* 114.2 (2026), p. 024089. DOI: [10.1103/sjgs-2px8](https://doi.org/10.1103/sjgs-2px8) [\[gr-qc\]](#) [\[arXiv: 2604.27734\]](#).
- Han Wang**, Michael J. Williams, Ian Harry, Yi-Ming Hu. “Archival inference for eccentric stellar-mass binary black holes in space-based gravitational wave observations”. In: *Phys. Rev. D* 113.6 (2026), p. 063040. DOI: [10.1103/tbgw-vnb7](https://doi.org/10.1103/tbgw-vnb7) [\[arXiv: 2510.07174\]](#) [\[astro-ph.HE\]](#) [\[gr-qc\]](#).
- Han Wang**, Ian Harry, Alexander Nitz, Yi-Ming Hu. “Space-based gravitational wave observatories will be able to use eccentricity to unveil stellar-mass binary black hole formation”. In: *Phys. Rev. D* 109.6, 063029 (Mar. 2024), p. 063029. DOI: [10.1103/PhysRevD.109.063029](https://doi.org/10.1103/PhysRevD.109.063029) [\[arXiv: 2304.10340\]](#) [\[astro-ph.HE\]](#) [\[gr-qc\]](#).
- En-Kun Li*, **Han Wang***, Hong-Yu Chen, Huimin Fan, Ya-Nan Li, et al. “GWSpace: a multi-mission science data simulator for space-based gravitational wave detection”. In: *Class. Quant. Grav.* 42.16 (2025), p. 165005. DOI: [10.1088/1361-6382/adf409](https://doi.org/10.1088/1361-6382/adf409) [\[arXiv: 2309.15020\]](#) [\[gr-qc\]](#) [\[astro-ph.HE\]](#).
- Ziming Wang, **Han Wang**, Yuxin Yang, Yiming Dong, Hai-Tian Wang, et al. “Cracking Gravitational Wave Multiple Ringdown Modes in Space”. In: (Apr. 2026). [\[arXiv: 2604.20914\]](#) [\[gr-qc\]](#) [\[astro-ph.HE\]](#).
- Hong-Yu Chen, **Han Wang**, En-Kun Li, Yi-Ming Hu. “Signal-to-noise ratio analytic formulae of the inspiral binary black holes in TianQin”. In: *Class. Quant. Grav.* 42.15 (2025), p. 155010. DOI: [10.1088/1361-6382/adeed9](https://doi.org/10.1088/1361-6382/adeed9) [\[arXiv: 2410.19401\]](#) [\[astro-ph.HE\]](#) [\[gr-qc\]](#).
- En-Kun Li, Hong-Yu Chen, Ya-Nan Li, Zhi-Yuan Li, **Han Wang**, et al. “Data Analysis of Space-borne Gravitational Wave Missions (in Chinese)”. In: *Sci. Sin.-Phys. Mech. Astron.* 55 (2025), p. 230406. DOI: [10.1360/SSPMA-2024-0357](https://doi.org/10.1360/SSPMA-2024-0357). URL: <https://www.sciengine.com/SSPMA/doi/10.1360/SSPMA-2024-0357>.
- En-Kun Li, Shuai Liu, Alejandro Torres-Orjuela, Xian Chen, Kohei Inayoshi, et al. (incl. **Han Wang**). “Gravitational wave astronomy with TianQin”. In: *Rept. Prog. Phys.* 88.5 (Sept. 2025), p. 056901. DOI: [10.1088/1361-6633/adc9be](https://doi.org/10.1088/1361-6633/adc9be) [\[arXiv: 2409.19665\]](#) [\[astro-ph.HE\]](#) [\[gr-qc\]](#).
- Hanzhang Wang, Shuai Liu, **Han Wang**, Chen Hong-Yu, Long Wang, Yi-Ming Hu. “Detection for Intermediate-mass Binary Black Holes in Population III Star Clusters with TianQin”. In: *Astron. Astrophys.* 697 (Mar. 2025), A49. DOI: [10.1051/0004-6361/202453615](https://doi.org/10.1051/0004-6361/202453615) [\[arXiv: 2503.15907\]](#) [\[astro-ph.HE\]](#) [\[gr-qc\]](#).
- Wei Su, Yan Wang, Chen Zhou, Lingfeng Lu, Ze-Bing Zhou, et al. (incl. **Han Wang**). “Analyses of Laser Propagation Noises for TianQin Gravitational Wave Observatory Based on the Global Magnetosphere MHD Simulations”. In: *Astrophys. J.* 914.2, 139 (June 2021), p. 139. DOI: [10.3847/1538-4357/abfc49](https://doi.org/10.3847/1538-4357/abfc49) [\[arXiv: 2102.10574\]](#) [\[astro-ph.HE\]](#) [\[gr-qc\]](#).