Haowen Zhong, Ph.D. Candidate

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INSPIRE HEP: https://inspirehep.net/authors/2613804

Homepage: https://haowen-zhong.github.io

Education

University of Minnesota, Ph.D. in Physics, Data Science in Astrophysics (Minor) — Sept 2021 – May 2026 (Expected)

- Advisor: Vuk Mandic

Huazhong University of Science and Technology, B.Sc. in Physics — Sept 2017 – May 2021

- Thesis title: *Gravitational waves from bubble collisions in FLRW spacetime.*
- Advisor: Biping Gong

Selected Publications and Preprints

- ***H. Zhong***, L. Reali, B. Zhou, E. Berti, and V. Mandic, "A two-step procedure to detect cosmological gravitational wave backgrounds with next-generation terrestrial gravitational-wave detectors," 2025. arXiv: 2501.17717 [gr-qc]. url:https://arxiv.org/abs/2501.17717.
- ***H. Zhong***, M. Isi, K. Chatziioannou, and W. M. Farr, "Multidimensional hierarchical tests of general relativity with gravitational waves," Phys. Rev. D, vol. 110, no. 4, p. 044 053, 2024. doi:10.1103/PhysRevD.110.044053. arXiv:2405.19556 [gr-qc].
- ***H. Zhong***, B. Zhou, L. Reali, E. Berti, and V. Mandic, "Searching for cosmological stochastic backgrounds by notching out resolvable compact binary foregrounds with next-generation gravitational-wave detectors," Phys. Rev. D, vol. 110, no. 6, p. 064 047, 2024. doi: 10.1103/PhysRevD.110.064047. arXiv: 2406.10757 [gr-qc].
- A. I. Renzini et al., "pygwb: A Python-based Library for Gravitational-wave Background Searches," Astrophys. J., vol. 952, no. 1, p. 25, 2023. doi: 10.3847/1538-4357/acd775. arXiv: 2303.15696 [gr-qc].
- ***H. Zhong***, R. Ormiston, and V. Mandic, "Detecting cosmological gravitational wave background after removal of compact binary coalescences in future gravitational wave detectors," Phys. Rev. D, vol. 107, no. 6, p. 064 048, 2023, [Erratum: Phys.Rev.D 108, 089902 (2023)]. doi: 10.1103/PhysRevD.107.064048. arXiv: 2209.11877 [gr-qc].
- ***H. Zhong***, B. Gong, and T. Qiu, "Gravitational waves from bubble collisions in FLRW spacetime," JHEP, vol. 02, p. 077, 2022. doi: 10.1007/JHEP02(2022)077. arXiv: 2107.01845 [gr-qc].

Teaching Experience as a Teaching Assistant

1. **Kinematics&Mechanics:**
   - **PHYS 1301:** Fall 2021
   - **PHYS 1101:** Spring 2025
2. **E&M:**
   - **PHYS 1302:** Spring 2022, Fall 2022, Spring 2023, Fall 2023, Spring 2024

Talks&Presentations

Seminars/Telecons

2025 **Importance of Shot Noise in the Search for an Isotropic Stochastic Gravitational-Wave Background with Next Generation Detectors**, August, LIGO stochastic subgroup telecon

2024 **Searching for cosmological stochastic backgrounds by notching out resolvable compact binary foregrounds with next-generation gravitational-wave detectors**, August, Sun Yat-Sen University

2024 **Generalizing hierarchical tests of general relativity with gravitational waves to arbitrary dimensions,**May, LIGO TGR telecon

2023 **Removing the Astrophysical Stochastic Gravitational Wave Foreground in Next-Generation Gravitational Wave Detectors & Arbitrary-Dimensional Hierarchical Test of GR with Gravitational Waves**, November, Johns Hopkins University

2022 **Detecting cosmological gravitational waves background after removal of compact binary coalescences in future gravitational wave detectors** , October, CE telecon

Conferences/LVK Meetings

2025 **Detecting a Cosmological Gravitational-Wave Background with Next-Generation Detectors**, Fundamental Physics Across the Gravitational Wave Spectrum, August, Chicago (IL)

2024 **Bypassing the Unresolvable Binary Neutron Star Foreground to Dig into Cosmological Background by Combining Notching Procedure and Joint Analysis**, LVK Meeting, September, Online

2024 **Updates on Detecting Cosmological Gravitational Wave Background by Notching Astrophysical Foreground out in t-f space**, LVK Meeting, March, Baton Rouge (LA)

2023 **Detecting cosmological gravitational waves background after removal of compact binary coalescences in future gravitational wave detectors**, APS Meeting, April, Minneapolis (MN)

2023 **Detecting cosmological gravitational waves background after removal of compact binary coalescences in future gravitational wave detectors**, LVK Meeting, March, Online

2022 **Dive into SGWB by Notching Out CBC Foreground For 3G Detector e.g (Cosmic Explorer)**, LVK Meeting, March, Evanston (IL)

Referee

Physical Review D

Awards and Achievements

1. **National Scholarship (2 out of 170),** 2020
2. **Merit Student Scholarship (10 out of 170),** 2020
3. **National Astronomical Observatory Scholarship (2 out of 340),** 2020
4. **National Astronomical Observatory Scholarship (2 out of 317)**, 2019
5. **Scholarship of Academic Excellence in school of Physics (8 out of 170),** 2019
6. **Scholarship of Self-Improvement for freshman (2 out of 22)** , 2018
7. **Scholarship of Academic Excellence for freshman (11 out of 155)**, 2018