

Jie Wu

PHD STUDENT IN PHYSICS

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Research

Gravitational wave	Signal simulation, Post-Newtonian waveform.
Detection	Space- and ground-based detectors, Time-delay interferometry, Detector noise.
Binary system	Stellar binary black hole, Massive black hole binary, Galactic binary.
Data processing	Parameter estimation, Fisher matrix, Bayesian analysis.
Gravitation	Modified theory of gravity, Cosmology, Dark matter.
Astronomy	Electromagnetic observation, Multi-messenger observation.

Currently, my primary research focus is on the simulation of gravitational wave signals in space, assessment of detector performance, and the processing and analysis of gravitational wave data.

Education

Chongqing University

PH.D. IN PHYSICS

Chongqing, China

Sep 2022 - Jun 2028 (expected)

- Advisor: Prof. Jin Li
- Research: Gravitational wave data simulation and detector performance evaluation

China West Normal University

B.S. IN PHYSICS

Nanchong, Sichuan, China

Sep 2018 - Jun 2022

- Advisors: Assoc. Prof. Di Wu and Assoc. Prof. Guo-Ping Li
- Research: Ground-based gravitational wave detection and data processing
- Thesis (in Chinese): An Analysis of the LIGO Gravitational Waves Data Based on Newtonian Approximate Model

Experience

Beijing Normal University

VISITOR

Beijing, China

Feb 2024 - Apr 2024

- Advisor: Prof. Zhoujian Cao
- Research: Gravitational wave waveform simulation and moving source effect

University of Chinese Academy of Sciences

PARTICIPANT

Beijing, China

Feb 2020 - Feb 2021

- Advisor: Assoc. Prof. Yong Tang
- Research: Analysis of gravitational wave data
- Program: College Student Innovation and Practice Program

Skills

Languages	Chinese (native), English.
Programming	Python, Mathematica, MATLAB
Data Analysis	Experienced in handling and analyzing datasets (statistical analysis, data visualization, and signal processing).
Teaching	High School Physics Teacher Qualification Certificate.

Honors & Awards

AWARDS

2023.12	Second Prize (Ranked 2nd/3rd) , The 7th Sichuan Chongqing Astronomy Competition
2022.6	Excellent Graduation Thesis , China West Normal U.
2022.5	Outstanding Graduate , China West Normal U.
2018.11	Third Prize (Ranked 7th/8th) , The 5th Sichuan Chongqing Astronomy Competition

SCHOLARSHIPS

- 2024.9 **Theoretical Physics Graduate Scholarship (Twice)**, Chongqing U.
2022-2023 **Graduate Academic Scholarship (Twice)**, Chongqing U.
2020-2022 **Fist-class Scholarship (Three times)**, China West Normal U.
2020.12 **Haotian Astronomy Scholarship**, Nanjing VasTech Astronomical Instrument & Equipment Co. Ltd.
2018-2021 **Second-class Scholarship (Four times)**, China West Normal U.

Publications

Publications are listed in reversed chronological order (*: corresponding author).

- [1] M. Sun, **J. Wu**, J. Li*, B. Mccane, N. Yang, X. Ma, B. Wang and M. Zhang, “Conditional Autoencoder for Generating Binary Neutron Star Waveforms with Tidal and Precession Effects,” (Mar. 2025). arXiv: 2503.19512.
- [2] **J. Wu**, M. Sun, X. Ma, X. Liu, J. Li* and Z. Cao*, “Effect of kick velocity on gravitational wave detection of binary black holes with space- and ground-based detectors,” (Feb. 2025). arXiv: 2502.13710.
- [3] X. Ma, B. Wang, N. Yang, J. Li*, B. McCane, M. Sun, **J. Wu**, M. Zhang and Y. Meng*, “Identification of Stochastic Gravitational Wave Backgrounds from Cosmic String Using Machine Learning,” (Feb. 2025). arXiv: 2502.11804.
- [4] Y. Hu, **J. Wu**, H. Luo, G. Su, X. Meng, L. Liu and G. Chen*, “Parallel manipulation of multiple ink droplets via near-infrared light on lubricant infused surface,” *Appl. Phys. Lett.*, **126**, 2, 021602, (Jan. 2025).
- [5] **J. Wu**, M. Sun and J. Li*, “Constraints and detection capabilities of GW polarizations with space-based detectors in different TDI combinations,” (Nov. 2024). arXiv: 2411.03631.
- [6] **J. Wu** and J. Li*, “Prospects of constraining on the polarizations of gravitational waves from binary black holes using space- and ground-based detectors,” *Phys. Rev. D*, **110**, 8, 084057, (Oct. 2024). arXiv: 2407.13590.
- [7] **J. Wu**, J. Li*, X. Liu and Z. Cao, “Comparison and application of different post-Newtonian models for inspiralling stellar-mass binary black holes with space-based GW detectors,” *Phys. Rev. D*, **109**, 10, 104014, (May 2024). arXiv: 2401.03113.
- [8] **J. Wu** and J. Li*, “Subtraction of the confusion foreground and parameter uncertainty of resolvable galactic binaries on the networks of space-based gravitational-wave detectors,” *Phys. Rev. D*, **108**, 12, 124047, (Dec. 2023). arXiv: 2307.05568.
- [9] **J. Wu**, J. Li* and Q.-Q. Jiang*, “Application of Newtonian approximate model to LIGO gravitational wave data processing,” *Chin. Phys. B*, **32**, 9, 090401, (Sep. 2023).