

# Jie Wu

PHD STUDENT IN PHYSICS

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## Research

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

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

## Honors & Awards

### AWARDS

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

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

- [1] Mengfei Sun, **Jie Wu**, Jin Li\*, Brendan Mccane, Nan Yang, Xianghe Ma, Borui Wang and Minghui Zhang, “Conditional Autoencoder for Generating Binary Neutron Star Waveforms with Tidal and Precession Effects,” (Mar. 2025). arXiv: 2503.19512.
- [2] **Jie Wu**, Mengfei Sun, Xianghe Ma, Xiaolin Liu, Jin Li\* and Zhoujian 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] Xianghe Ma, Borui Wang, Nan Yang, Jin Li\*, Brendan McCane, Mengfei Sun, **Jie Wu**, Minghui Zhang and Yan Meng\*, “Identification of Stochastic Gravitational Wave Backgrounds from Cosmic String Using Machine Learning,” (Feb. 2025). arXiv: 2502.11804.
- [4] Yalin Hu, **Jie Wu**, Haiyan Luo, Guanqi Su, Xiangxi Meng, Liyu Liu and Guo Chen\*, “Parallel manipulation of multiple ink droplets via near-infrared light on lubricant infused surface,” *Appl. Phys. Lett.*, **126**, 2, 021602, (Jan. 2025).
- [5] **Jie Wu**, Mengfei Sun and Jin Li\*, “Constraints and detection capabilities of GW polarizations with space-based detectors in different TDI combinations,” (Nov. 2024). arXiv: 2411.03631.
- [6] **Jie Wu** and Jin 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] **Jie Wu**, Jin Li\*, Xiaolin Liu and Zhoujian 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] **Jie Wu** and Jin 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] **Jie Wu**, Jin Li\* and Qing-Quan Jiang\*, “Application of Newtonian approximate model to LIGO gravitational wave data processing,” *Chin. Phys. B*, **32**, 9, 090401, (Sep. 2023).