

# Wei Cheng

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## EDUCATIONAL BACKGROUND

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| Sun Yat-sen University                                                                                                                                                                                                                                                                                                                                 | Guangdong, China  |
| Major in Physics; GPA 4.18/5.0(GPA Ranking: 8/132)                                                                                                                                                                                                                                                                                                     | 2022.08 - 2026.07 |
| <ul style="list-style-type: none"><li><b>Core Courses:</b> Electronmagnetics (97); Optics (96); Fundamental Astronomy (94); Electrodynamics (93); Thermodynamics (96); Theoretical Mechanics (93); Atomic Physics (97); Thermodynamics and Statistical (98)</li><li><b>Research Interest:</b> Gravitational Wave Physics, Black Hole Physics</li></ul> |                   |

## MAIN RESEARCH EXPERIENCE

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| Bayesian Analysis of Gravitational Wave Signa from Double White Dwarfs Based on the "Tianqin" Project                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |
| Researcher                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2023.12 - 2024.12 |
| <ul style="list-style-type: none"><li><b>Signal Generation:</b> Generated gravitational wave signals from the binary white dwarf systems J0806 using the Python package GWspace and simulated the noise characteristics of the Tianqin detector.</li><li><b>Parameter Estimation and Bayesian Analysis:</b> Employed the MCMC (Monte Carlo-Markov Chain) algorithm to estimate key parameters of the gravitational wave signals (frequency, frequency derivative, source position, and orbital inclination, etc) in high-dimensional space and achieved Bayesian inversion of these parameters.</li><li><b>Fisher Information Matrix Validation:</b> Combined Fisher Information Matrix to evaluate the precision and uncertainty of parameter estimation; Found that increasing the equivalent observation duration significantly improved parameter precision and gradually eliminated parameter degeneracies, thereby verifying the reliability of the MCMC algorithm.</li></ul>                                                                                                                                                    |                   |
| Weak Magnetic Field Measurement System Based on Optical Pumping Magnetic Resonance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                   |
| Researcher                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2024.04 - 2024.10 |
| <ul style="list-style-type: none"><li><b>System Design and Construction:</b> Designed and constructed a weak magnetic field measurement device based on the principle of optically pumped magnetic resonance, including an atomic vapor cell, magnetic field control module, optical system, and data acquisition module, enabling high-precision measurement of weak magnetic fields.</li><li><b>Coil Framework Design and Magnetic Field Simulation:</b> Designed the coil framework using SolidWorks software and simulated the magnetic field distribution of the system using COMSOL; Optimized the coil design to generate a uniform magnetic field within the experimental region.</li><li><b>Magnetic Field Measurement and Calibration:</b> Conducted measurements and calibrations of steady-state magnetic fields (10<math>\mu</math>T - 50<math>\mu</math>T and 0.05<math>\mu</math>T - 5<math>\mu</math>T) and low-frequency alternating magnetic fields (1<math>\mu</math>T - 7<math>\mu</math>T); Ensured that the system is capable of measuring weak magnetic fields with a measurement precision of 100nT.</li></ul> |                   |

## PERSONAL HONORS

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| National Scholarship for Undergraduate Students                                            | 2022-2023 academic year |
| National Scholarship for Undergraduate Students                                            | 2022-2024 academic year |
| First-class Scholarship at Sun Yat-sen University                                          | 2022-2023 academic year |
| First-class Scholarship at Sun Yat-sen University                                          | 2022-2024 academic year |
| Sun Yat-sen University Banyan Tree Talent Support Program                                  | 2022-2026 academic year |
| Second Price in 25th South China University Student Physics Experiment Design Competition. | Oct. 2024               |
| Third Prize of the 13th MathorCup Mathematical Modeling Challenge One                      | Jun. 2023               |
| Star Volunteer of Sun Yat-sen University                                                   | Mar. 2024               |
| Outstanding Communist Youth League Cadre at Sun Yat-sen University                         | May. 2024               |