Qian Hu

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EDUCATION

University of Science and Technology of China (USTC) **Hefei, China**
Undergraduate in Department of Astronomy, School of Physical Sciences *Aug 2017 - Present*
GPA: 3.90/4.30, Ranking: 22/350 in School of Physical Sciences

REASEARCH INTEREST

- **Gravitational-wave (GW) astronomy**: Data analysis (both traditionally and machine learning), multi-messenger astronomy& GW's physical implications.
- **Cosmology**: Problems around dark matter, dark energy, and primordial gravitational-wave.

RESEARCH EXPERIENCE

Semi-analytical Approach for Sky Localization of Gravitational Waves **June 2020 - Present**
Advisor: Prof. Linqing Wen@The University of Western Australia

- Derive a semi-analytical solution of the Bayesian posterior probability for GW source sky location.
- This localization algorithm has low latency and good self-consistency, and will be implemented to the online GW detection pipeline SPIIR.
- Paper in preparation as first author.

Research on joint observations of space-borne GW detectors **Feb 2020 - June 2020**
Advisor: Prof. Wen Zhao@USTC

- Modify the Python package Bilby, and enable it to perform Bayesian parameter estimation on space-borne GW detectors.
- Investigate the improvements of GW source localization and constraint on parity-violating gravity given by space-borne GW detector networks.
- Paper submitted to Science Bulletin as first author.

Fast gravitational wave localization based on null SNR **July 2019 - Aug 2019**
Advisor: Prof. Linqing Wen@The University of Western Australia

- Use the stability of distribution of null SNR to reduce the influence caused by non-Gaussian noise during GW source localization.
- Construct probability skymap based on null SNR and coherent SNR, and give GW source localization.

Model-Independent test of the parity symmetry of gravity using GWs **Feb 2019 - Aug 2020**
Advisor: Prof. Wen Zhao@USTC

- Develop a waveform-independent method to extract right-hand and left-hand polarizations of GWs from GW data.
- By comparing arrival time of circular polarizations, give the constraint on velocity birefringence in parity-violating gravity.
- Paper published in EPJC as coauthor.

PUBLICATIONS

1. **Qian Hu**, Cong Zhou, Jhao-Hong Peng, Linqing Wen, Qi Chu, Manoj Kovalam, *Semi-analytical Approach for Sky Localization of Gravitational Waves*, in preparation.
2. **Qian Hu**, Mingzheng Li, Rui Niu, and Wen Zhao. *Constraining parity asymmetry of gravity withjoint observations of space-borne gravitational-wave detectors*, submitted to Science Bulletin.

3. Wen Zhao, Tan Liu, Linqing Wen, Tao Zhu, Anzhong Wang, **Qian Hu**, and Cong Zhou. *Model-independent test of the parity symmetry of gravity with gravitational waves. The European PhysicalJournal C, 80(7), Jul 2020.*

TEACHING

Physical experimental software design & development **July 2020 - Present**

Member of a national virtual experimental teaching project

- Design and develop an educational application of GW data simulation, data analysis and Bayesian parameter estimation for physical experiment teaching.
- The software will be employed in experimental teaching for junior students at USTC in 2021.

Classical Mechanics and Electrodynamics **2020 Fall@USTC**

Teaching assistant

- Correct homework, answer questions and give refresher classes.

AWARDS

- National Scholarship, USTC, 2020
- Outstanding Student Scholarship, USTC, 2019
- CGN Scholarship (Gold), USTC, 2019
- Outstanding Student Scholarship, USTC, 2018

STANDARDIZED TEST

- TOEFL 101 (R: 28 L: 29 S: 22 W: 22). Best Score: 105

PROFESSIONAL SKILLS

- Python, C, Matlab, Mathematica, LaTeX.