



Cosmic Tidal Reconstruction and Parity-Violating Mode Analysis

朱弘明 研究员 (国家天文台)

Hong-Ming Zhu has been a faculty member at the National Astronomical Observatories, Chinese Academy of Sciences, since August 2023. He obtained his PhD at the University of Chinese Academy of Sciences in 2017. He was a BCCP fellow at the University of California, Berkeley from 2017 to 2020 and then a CITA fellow at the Canadian Institute for Theoretical Astrophysics from 2020 to 2023.



The large-scale structures of the Universe exhibit striking non-Gaussian features, often referred to as the cosmic web. The strong non-Gaussian nature of this system has traditionally limited the cosmological information that can be extracted from galaxy surveys, a phenomenon known as information saturation. In this talk, I will first show how we can recover the lost small-scale information using a nonlinear reconstruction algorithm. Then, I will discuss how we can exploit local anisotropic small-scale non-Gaussian structures to reconstruct the large-scale matter distribution. The tidal reconstruction technique can help recover the 21 cm radial modes lost due to foreground contamination. Furthermore, I will demonstrate that tidal reconstruction can probe primordial parity-violating signatures. These findings have significant implications for current and future surveys, such as DESI, PFS, CSST, and others.

时间： 2025年4月23日 (星期三) 10:00

地点： 北京师范大学物理楼402

联系人： 李正祥, Email: zxli918@bnu.edu.cn