Astronomy Seminar

李政道研究所
SHANGHAI JIAO TONG UNIVERSITY
TSUNG-DAO LEE INSTITUTE

Learning Fundamental Physics from the Stochastic Gravitational Wave Background

Time: 14:00-15:00, 18 October (Friday), Shanghai time

Venue： N601（TDLI）

Host: Yipeng Jing (景益鹏)

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Meeting ID: 470449898

Dr. Meng-Xiang Lin

University of Pennsylvania

Abstract:

The recent success in detecting the Stochastic Gravitational Wave Background (SGWB) using Pulsar Timing Arrays (PTAs) has opened a new window for testing fundamental physics. Additionally, SGWB detection through astrometry presents an exciting avenue for further exploration. In this talk, I will discuss the potential insights into fundamental physics that future SGWB measurements may provide. First, I will explore tests of gravity theories using the PTA angular correlation function, incorporating more realistic gravitational waveforms from binary inspirals. Then, I will discuss how astrometry can probe parity-violating theories—something that PTAs alone cannot achieve. Finally, I will examine the correlation between PTA data and galaxy surveys, offering opportunities to study the large-scale structure of the cosmos and the evolutionary history of supermassive black holes.

Biography:

Dr. Meng-Xiang Lin is currently a Postdoctoral Fellow of Center of Particle Cosmology at University of Pennsylvania. Before going to UPenn, he did his undergrad at Peking University and PhD at University of Chicago. He is generally in terested in various topics of theoretical cosmology. Specifically, his work mainly focuses on seeking theoretical solutions to cosmological tensions, and using gravitaional waves to test fundamental physics.

Astronomy and Astrophysics Division
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