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国台学术报告 NAOC COLLOQUIUM

2022 年 第 13 次 / No. 13 2022

Time: Wednesday, 2:30 PM, Dec. 7th,2022

Tencent ID: 629316249/123456 & Live Streaming

Binary Neutron Stars: Mergers, Kilonovae, and their Host Galaxies

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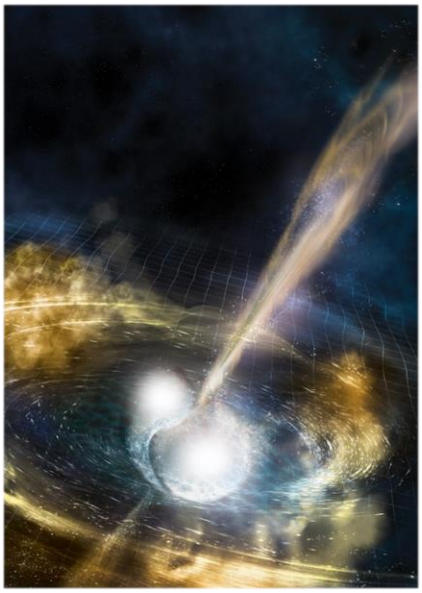
Prof. Youjun Lu is a researcher at the National Astronomical Observatories of China. He obtained his BS in physics in 1992 from Anhui University and PhD in astrophysics in 1997 from University of Science and Technology of China. He currently serves as the principal investigator of the gravitational wave astrophysics research group in the National Astronomical Observatories of China. His main interests include the gravitational wave astrophysics, black hole physics, active galactic nuclei, galaxies and cosmology.

Abstract



The merger of binary neutron stars (BNS) is one of the most interesting events in the universe. BNS mergers are the prime targets of the multi-messenger observations, as these mergers involve not only the copious radiation of both multiband gravitational and electromagnetic waves, but also the richest microphysics in the strongest gravitational field and extreme matter densities. A deep understanding of the current and future BNS observations requires detailed modelling for the origin of BNSs and the corresponding electromagnetic signatures from BNS mergers. In this talk, he will briefly overview the gravitational wave and electromagnetic observations of GW170817 and GW190425, the first and second BNS mergers detected by LIGO-Virgo. Then he will introduce a comprehensive model for the formation and evolution of BNSs in the universe and a phenomenological model for kilonova. He will talk about the BNS merger rate density, kilonova properties, and the host galaxies properties of BNS mergers, estimated from these models. Finally, he will also talk about the prospects of BNS merger studies.

All are welcome !