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Multiband Gravitational Wave and Multimessenger Astronomy with Galactic compact binaries

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The upcoming era of gravitational wave (GW) astronomy heralds unprecedented opportunities to study compact binaries, in particular double neutron stars (DNS), double white dwarfs (DWD), and binary black holes, through their gravitational waves, providing important insights into binary evolution, NS physics, and the overarching architecture of the universe. In this talk, I will give an overview of our investigation on the scientific objectives and data analysis pertinent to these compact binaries, emphasizing the multi-messenger observations of DNSs and DWDs in our Galaxy that synergize the capabilities of LISA, TianQin, and current and future optical and radio telescopes, and the promising multi-wavelength observations of the low-frequency GWs due to the binary motion of a DNS and the high-frequency GWs due to the spin of the aspherical NS component. The talk also discusses the challenge of data analysis for the stellar-mass binary black holes and presents our novel solution, which includes both algorithmic and hardware accelerations.

Collaboration you are representing

Author: WANG, Yan (Huazhong University of Science and Technology)

Presenter: WANG, Yan (Huazhong University of Science and Technology)

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