Fast and faithful effective-one-body models for gravitational waves from generic compact binaries

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The detection and analysis of gravitational waves (GWs) from compact binary systems rely on precise modeling of the expected signals. However, accurately modeling GWs emitted by coalescing binary black hole (BBH) and binary neutron star (BNS) systems remains a formidable challenge due to the complexity of the underlying physical processes.

In this talk, I will summarize my efforts toward the development of computationally efficient and accurate models for GWs emitted by generic compact binary systems within the effective-one-body framework. The term "generic" here encompasses both the nature of the binary components – black holes, neutron stars, or mixed systems – and the diverse properties influencing their evolution, including eccentricity, spin effects, and matter interactions. I will then discuss their application to real GW data analysis.

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