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Supermassive boson stars in extreme-mass-ratio inspirals: resonances and gravitational waves

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The historic detection of gravitational waves paved the way for precision gravitational-wave astrophysics to blossom at unprecedented proportions. In this talk, I will focus on extreme-mass-ratio inspirals (EMRIs) that consist of a primary supermassive compact object, and a stellar-mass secondary companion. Even though we are currently performing pertinent tests in order to characterize the Kerrness of astrophysical compact objects that reside in galactic cores, environmental effects, quantum corrections and generic multipolar deformations can significantly affect the gravitational-wave emission from these EMRIs. I will discuss the rich orbital and waveform phenomenology of non-Kerr inspirals as well as potential observables of orbital resonances in EMRIs with a supermassive rotating boson star primary. Finally, I will briefly discuss the impact of exotic horizonless objects on the gravitational radiation emitted from such binaries, in order to shed more light into the electromagnetic degeneracies that currently exist between black holes and exotic compact objects.

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