

Contributed Talk

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Title: Gravitational-wave imprints of non-integrable extreme-mass-ratio inspirals

Abstract: The detection of gravitational waves from extreme-mass-ratio inspirals (EMRIs) with upcoming space-borne detectors will allow for unprecedented tests of general relativity in the strong-field regime. Aside from assessing whether black holes are unequivocally described by the Kerr metric, they may place constraints on the degree of spacetime symmetry. Depending on exactly how a hypothetical departure from the Kerr metric manifests, the Carter symmetry, which implies the integrability of the geodesic equations, may be broken. In this talk, I will discuss the impact of non-integrability in EMRIs which involve a supermassive compact object with anomalous multipolar structure. After reviewing the features of chaotic phenomena in EMRIs, I will argue that non-integrability is precisely imprinted in the gravitational waveform. Explicit examples of non-integrable EMRIs will be discussed, as well as their role in LISA data analysis.