

Extreme mass-ratio inspirals into black holes surrounded by scalar clouds

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Scalar clouds can form through superradiant instabilities of massive scalar fields around spinning black holes and can also serve as a proxy for dark matter structures around black holes. They can potentially be detected through a number of signatures, including the possibility that they can affect the dynamics of binary black hole systems. In this talk, I will discuss recent work aiming at studying extreme-mass-ratio systems in which a small compact object inspirals around a supermassive black hole surrounded by a scalar cloud. In particular, I will present the first steps towards studying those systems in a fully relativistic setup (i.e. making use of tools from black hole perturbation theory).

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