

Perturbation Theory from Curvature Wave Equations and Ringdown Nonlinearities

Wednesday, 16 October 2024 15:40 (20)

The prospect of observing loud ringdowns from massive black hole mergers with LISA opens an unprecedented window into the strong-field regime of gravity. Using this opportunity hinges on our ability to extend the current paradigms of black hole perturbation theory and ringdown modelling to account for dynamical non-linearities. In this talk, I will present a new approach to black hole perturbation theory in spherical symmetry, based on the so-called curvature wave equations, and provide a systematic derivation of a number of important results in the literature. As an application, I will discuss an effective model to describe the ringdown of a mass-varying spacetime and its potential to capture absorption-induced excitations. To conclude, I will discuss some recent progress in understanding late-time ringdown tails driven by either sources or non-linear effects.

Presenter(s) : PEREÑIGUEZ, David (Niels Bohr Institute)

Session Classification : Contributed Talks + Roadmap for the Spanish contribution to LISA