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CIDMA — CENTRO DE I&D EM MATEMÁTICA E APLICAÇÕES
CENTER FOR R&D IN MATHEMATICS AND APPLICATIONS

Gravitational Geometry and Dynamics Group Seminar

Wed. 10th May '23 On Campus at 15h30

Asymmetric binaries as astrophysical laboratories to probe new physics

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Zoom meeting ID 962 2413 8340

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Asymmetric binaries provide a unique phenomenology within the family-tree of coalescing systems, which makes them golden targets for future gravitational wave interferometers. Assembled by a compact object orbiting around a more massive body, they can emit gravitational waves from the milliHz to the Hz regime, depending on the size of their components. Their slow orbital evolution allows to map the binary spacetime with exquisite precision, leading to the exciting possibility to use the emitted signals as a new tool to perform precision tests for a plethora of astrophysical and fundamental physics scenarios.

In this talk I will review some of the possibilities offered by asymmetric binaries, and in particular by the Extreme Mass Ratio Inspirals, focusing on their ability to provide novel insights on the features of the environment in which binaries evolve and, on the existence of new fundamental fields coupled to gravity sector. I will show why EMRIs represent the best arena to probe each specific science case, describing the theoretical framework in which they are embedded, and the data analysis strategy which can be used to constrain the physical properties of each model.

https://videoconfcolibri.zoom.us/j/96224138340?pwd=YkZUMGlLb0dqVjcxOVpXMTFVMTBXQT09

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