

Seminário, Terça 04/11/2025 14:00h

Local: Auditório DRCC

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Title: Gravitational waves from binary systems of compact objects

Abstract: The era of gravitational-wave astronomy began 10 years ago, with the first detection by LIGO of a signal emitted during the coalescence of two ~ 30 solar mass black holes. In this seminar, I will start by giving an overview of some key results in gravitational-wave science ever since, including the discovery of intermediate-mass black holes, the birth of multi-messenger astronomy, the first tests of gravitation theory in the strong-field regime, a precise characterization of black hole "ringing", an independent measure of the Hubble constant, and constraints on the equation of state of matter at supra-nuclear density. Since its third observing run, however, the LIGO-Virgo-KAGRA Collaboration has begun to detect gravitational-wave signals, such as GW191219_163120, whose sources involve large mass ratios, which are extremely challenging for waveform modelling. This might result in systematic uncertainties in the estimation of the source parameters, including the mass ratio, inclination and luminosity distance. As a potential solution I will present a new, promising class of waveforms that could faithfully model such gravitational-wave sources.