

Beyond general relativity: gravitational waves in non-minimally coupled theories

Friday, 31 October 2025 16:00 (30 minutes)

Non-minimal matter-curvature couplings arise in many different contexts, and modify solutions of general relativity. If dark matter (DM) experiences non-minimal couplings, the imprint can be seen in gravitational waves (GWs) emitted from binary black hole mergers, where DM densities are expected to be large. In this talk, we explore effects of various non-minimal couplings on GWs by working with a model-independent parameterization for left- and right-handed GW strains. We will write down the general solution assuming slowly-varying matter fields, and then systematically apply our results to three models: Kalb-Ramond dark matter with dimension-four operators, axion-dilaton-Chern-Simons-Gauss-Bonnet dimension-five operators, and dimension-six couplings to a (dark) vector field.

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