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Theory: Black-hole evolution in the presence of scalar fields

Tuesday, September 5, 2023 5:00 PM (15 minutes)

I will present recent analytical results on the evolution of the trapping horizon of a spherically symmetric black hole, as due to the backreaction of scalar radiation on the geometry in the low-frequency approximation. A simple closed-form expression can be derived for the expansion rate of the horizon in terms of initial data for the scalar field on past null infinity. This is obtained by solving the field equations to second order in perturbation theory in the vicinity of the horizon, and using matched asymptotic expansions to compute the evolution of wave packets through the potential barrier.

Presenter: DE CESARE, Marco

Session Classification: Parallel Sessions