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Invited Talk: Jaime Redondo-Yuste (Title: Nonlinear effects in perturbation theory)

Tuesday, 27 May 2025 14:15 (45 minutes)

Title: Nonlinear effects in perturbation theory

Abstract:
General relativity is a nonlinear theory, and understanding its nonlinear features is crucial for many physical phenomena. In this talk I will motivate the study of subleading orders in perturbation theory. I will first review some generalities of perturbation theory in symmetric spacetimes, and then focus on black hole backgrounds. Nonlinear effects become relevant during the ringdown phase, where they may be observable with upcoming gravitational wave detectors. I will outline different theoretical approaches to this problem, including a recent formulation using symmetric spinors. Finally I will present new results on the excitation of quadratic quasinormal modes in the high frequency limit, and discuss its implications for the stability of black hole spacetimes.