Black Holes, Neutron Stars, and Gravitational Waves @ Black Sea



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Black Hole Dynamics in Extensions of General Relativity

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Extensions of General Relativity can give rise to black holes with nontrivial scalar structure, commonly called "hairy" black holes. This work investigates the dynamics of spherically symmetric black holes in scalar–Gauss–Bonnet gravity through fully nonlinear simulations incorporating excision techniques. These theories often suffer from an ill-posed initial value formulation, which limits their predictive power. We show that, within the framework of effective field theory, including appropriately chosen interactions, resolves this issue. Our results offer a path toward restoring predictivity in extended gravitational theories and provide new insights into their consistent formulation.

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