



GRAVITY: CHALLENGES BEYOND GENERAL RELATIVITY

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Dynamics, hyperbolicity and singularities in spherically symmetric massive gravity

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In modified theories of gravity, the question of well-posedness of their equations underlies any attempts at numerical simulations. These in turn are crucial for comparison with experimental data and possible confirmation of the theory's predictions. In this talk, we will concentrate on ghost-free massive gravity, notable for being a genuine IR modification of general relativity. Through a clever choice of variables, its equations in spherical symmetry can be rendered strongly hyperbolic, and hence well-posed. This enables us to perform numerical simulations of spherical collapse. For small initial data, we find that the matter simply disperses. However, as we increase the amplitude of the initial data, the evolution eventually becomes singular in a way distinct from black hole formation in standard GR.

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