

Pathologies of brane-induced higher-curvature gravity

A well-motivated class of higher-curvature gravity theories is obtained from the gravity induced on a brane in an AdS bulk. In dual holographic terms, gravity is induced by integrating UV degrees of freedom of a quantum conformal theory. When the brane is flat, we can write down an effective quadratic action in a closed form which can be used to compute the propagator of metric perturbations on the brane. We study its pole structure, finding infinite towers of ghost modes, as well as tachyons and more exotic modes in some cases. From the perspective of the bulk, however, the effective action on the brane should also be coupled to the CFT that is dual to the AdS bulk. We redo and expand the original Karch-Randall bulk analysis to show that, indeed, taking the CFT coupling into account renders the theory free of pathologies. We further expand their work by considering the case in which one adds an explicit DGP coupling on the brane, and explore the regime of allowed parameters of this setup.

Presenter: LLORENS, Quim (ICCUB)