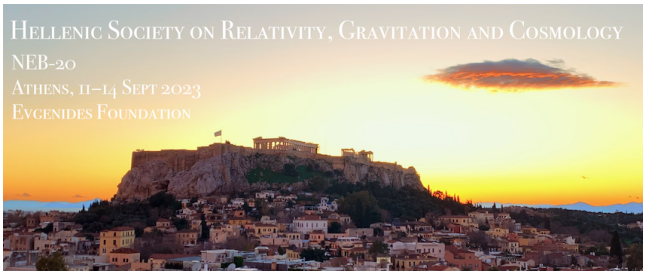

Contribution ID: **68** Type: **not specified**

Stealth Ellis Wormholes In Horndeski theories

Wednesday, 13 September 2023 16:10 (20 minutes)

In this work we are revisiting the well studied Ellis wormhole solution in a generalized Horndeski theory motivated from the Kaluza-Klein compactification procedure of the more fundamental higher dimensional Lovelock gravity. We show that the Ellis wormhole is analytically supported by a gravitational theory with a non-trivial coupling to the Gauss-Bonnet term and we expand upon this notion by introducing higher derivative contributions of the scalar field. The extension of the gravitational theory does not yield any back-reacting component on the spacetime metric, which establishes the Ellis wormhole as a stealth solution in the generalized framework. We propose two simple mechanisms that dress the wormhole with an effective ADM mass. The first procedure is related to a conformal transformation of the metric which maps the theory to another Horndeski subclass, while the second one is inspired by the spontaneous scalarization effect on black holes.

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Session Classification: Parallel Session A