

## Modified-gravity wormholes without exotic matter

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### Abstract

A fundamental ingredient in wormhole physics is the flaring-out condition at the throat which, in classical general relativity, entails the violation of the null energy condition. In this work, we present the most general conditions in the context of modified gravity, in which the matter threading the wormhole throat satisfies all of the energy conditions, and it is the higher order curvature terms, which may be interpreted as a gravitational fluid, that support these nonstandard wormhole geometries. Thus, we explicitly show that wormhole geometries can be theoretically constructed without the presence of exotic matter but are sustained in the context of modified gravity. © 2013 American Physical Society.

<http://dx.doi.org/10.1103/PhysRevD.87.067504>

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