

# Theory: Regular Black Holes in Lorentz-violating Gravity

*Tuesday, September 5, 2023 4:45 PM (15 minutes)*

There is growing evidence that Hořava gravity may be a viable quantum theory of gravity. It is thus legitimate to expect that gravitational collapse in the full, non-projectable version of the theory should result in geometries that are free of spacetime singularities. Previous analyses have shown that such geometries must belong to one of the following classes: simply connected regular black holes with inner horizons; non-connected black holes “hiding” a wormhole mouth (black bounces); simply connected or non-connected horizonless compact objects. In this talk, I will describe examples of possible “regularisations” of a (singular) black hole solution in the low-energy limit of non-projectable Hořava gravity, i.e. khronometric theory. Though these examples do not constitute vacuum solutions, their study contributes to shed light on the interplay between singularity removal and broken Lorentz invariance.

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