

Non-Singular Astrophysical Blackhole

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I will discuss how non-singular astrophysical blackholes can be constructed within infinite derivative theory of gravity which can be devoid of an event horizon. Typically, the conventional blackhole can be thought of as a quantum hole with infinitely many gravitational states, which behaves very similar to a classical blackhole when it comes to the Hawking radiation, but the information never gets lost due to the fact that there is no event horizon. I will discuss scenarios when such a quantum hole can be made detectable and what are the potential signatures, which can match the current and future observations. The non-local gravitational interactions behave very similar to Mathur's fuzz ball scenario already been discussed in the literature, and also very similar to graviton being a condensate proposal by Dvali and Gomez.