

XXXV International Workshop on High Energy Physics "From Quarks to Galaxies: Elucidating Dark Sides"

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Regular Black Holes

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Black holes are the natural product of the complete gravitational collapse of matter and today we have a body of observational evidence supporting the existence of these objects in the Universe. However, general relativity predicts that at the center of black holes there are spacetime singularities, where predictability is lost and standard physics breaks down. It is widely believed that spacetime singularities are a symptom of the limitations of general relativity and must be solved within a theory of quantum gravity. Since we do not have yet any mature and reliable candidate for a quantum gravity theory, researchers have studied toy-models of singularity-free black holes and of singularity-free gravitational collapses in order to explore possible implications of the yet unknown theory of quantum gravity. In my talk, I will present some recent models of regular black holes and non-singular gravitational collapses and I will discuss their theoretical and observational implications.

Information on the subject:

<https://arxiv.org/abs/2210.05322>

This is another paper relevant to my presentation:

<https://arxiv.org/abs/2307.12755>

Webpage: <https://cosimobambi.github.io/>

- Editor Springer Series in Astrophysics and Cosmology Webpage: <https://www.springer.com/series/17008>

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