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Superradiant Production of Heavy Dark Matter from Primordial Black Holes

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Spinning black holes (BHs) can efficiently transfer energy to the surrounding environment via superradiance. In particular, when the Compton length of a particle is comparable to the gravitational radius of a BH, the particle's occupation number can be exponentially amplified. In this talk, I will discuss the effect of the primordial-black-hole (PBH) superradiant instabilities on the generation of heavy bosonic dark matter (DM) with mass above 1 TeV. I will show that superradiance can significantly increase the DM density produced by PBHs with respect to the case that only considers Hawking evaporation, and hence lower initial PBH densities are required.

Summary

Primary authors: Prof. BERNAL, Nicolas (Antonio Narino U.); Dr PEREZ-GONZALEZ, Yuber F. (Durham U.); XU, Yong (Bethe Center for Theoretical Physics, Universität Bonn)

Presenter: XU, Yong (Bethe Center for Theoretical Physics, Universität Bonn)

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