

Dark and shiny dresses around Primordial Black Holes

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I will discuss the interplay between the phenomenology of primordial black holes and the dark matter searches. I will first briefly review the most relevant constraints on PBH abundance, highlighting the caveats and uncertainties. Then, I will discuss how a sub-dominant component of PBHs interacts with the bulk of the DM. In particular, I will describe how a DM “mini-halo” is expected to form around PBHs, with relevant phenomenological consequences. The focus will be on two effects in particular. (i) The dark mini-halo can alter the evolution of a PBH binaries due to dynamical friction. I will discuss the impact of friction on the merger rate of a population of PBHs, and the subsequent impact on current bounds and future high-redshift searches. (ii) If the bulk of the DM is composed of WIMPs, the mini-halos would shine in gamma rays. Hence, a hypothetical future detection of a sub-dominant component of PBHs could allow to set very stringent constraints on the WIMP annihilation cross section.

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