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Primordial Black Holes as Silver Bullets for New Physics at the Weak Scale

Thursday 26 September 2019 09:40 (20 minutes)

Observational constraints on gamma rays produced by the annihilation of weakly interacting massive particles around primordial black holes (PBHs) imply that these two classes of Dark Matter candidates cannot coexist. In this talk, I will show that the successful detection of one or more PBHs by radio searches (with the Square Kilometer Array) and gravitational waves searches (with LIGO/Virgo and the upcoming Einstein Telescope) would set extraordinarily stringent constraints on virtually all weak-scale extensions of the Standard Model with stable relics, including those predicting a WIMP abundance much smaller than that of Dark Matter. Upcoming PBHs searches have in particular the potential to rule out almost all of the favorable parameter space of popular theories such as the minimal supersymmetric standard model and scalar singlet Dark Matter.

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