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Primordial Black Holes and Dark Matter from Axion Inflation

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According to the Standard Model of Cosmology, about 25% of the content of the universe is composed of dark matter. From a theoretical point of view, there are many possible alternatives to explain its origin and composition, ranging from ultralight axions to supermassive black holes. However, despite many experimental efforts, the nature of dark matter is still obscure. One interesting possibility is that dark matter is composed of Primordial Black Holes (PBHs), arising from high peaks in the matter power spectrum of some inflationary models. In this talk, I will show that models of axion-inflation in which the inflaton is coupled to massless gauge fields and non-minimally coupled to gravity can give rise to the production of PBHs. I will discuss the possibility that such PBHs compose a fraction of the dark matter observed in the universe, and I will present some ideas about a possible UV completion of such inflationary model.

Presentation type

Parallel talk

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