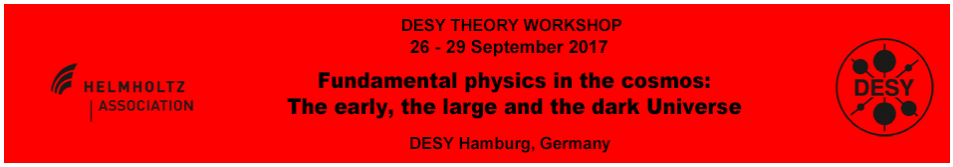

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Primordial Black-Holes from Critical Higgs Inflation

Thursday 28 September 2017 17:48 (17 minutes)

The question of the origin of the dark matter (DM) remains as one of the most fundamental mysteries of modern physics. LIGO detections may be the first observations of a large population of primordial black-holes (PBHs) that could constitute today the dominant component of the DM. These PBHs arise naturally in models of Critical Higgs Inflation (CHI), where there is a peak in the spectrum associated to the near-critical value of the running of both the Higgs self-coupling and its non-minimal coupling to gravity. The CMB spectrum at large scales of this model is in agreement with Planck-2015 data, with a relatively large tensor-to-scalar ratio that may be detected soon with B-mode polarization experiments. Moreover, it predicts a broad lognormal PBH mass distribution that is consistent with the present constraints on PBH. The stochastic background of gravitational waves coming from the unresolved black-hole-binary mergings could be detected by LISA or PTA. The PBH-CHI scenario opens a new portal to test fundamental physics above the LHC scale.

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