

Dark matter from hot big bang black holes

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If the temperature of the hot thermal plasma in the Early Universe was within a few orders of magnitude of the quantum gravity scale, then the hoop conjecture predicts the formation of microscopic black holes from particle collisions in the plasma. These black holes may evaporate and produce the dark matter relic abundance observed today for a wide variety of dark matter masses. We study the production of dark matter in standard cosmology and in the scenario of low-scale quantum gravity such as large extra dimensions. In the former case black holes evaporate instantly, while in the latter case dark matter may accrete and become macroscopic, leading to rich phenomena in the late Universe.

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