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Low-mass primordial black holes as the dark matter candidate

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Primordial black holes (PBHs), possibly formed via gravitational collapse of large density perturbations in the very early universe, are one of the earliest proposed and viable dark matter (DM) candidates. Recent studies indicate that PBHs can make up a large or even entire fraction of the present day DM density for a wide range of masses. Ultralight

PBHs in the mass range of 10^{15} - 10^{17} g, emit particles through Hawking radiation, and can be probed via observations of those emitted particles in various detectors. In this talk, I will discuss how the observations of the 511 keV gamma ray line and continuum gamma-rays set some of the most stringent exclusion limits on the DM fraction of ultralight PBHs. I will also demonstrate how measurements of low-energy photons from the Galactic Center by the imminent telescopes such as AMEGO can probe the DM fraction of PBHs into a completely unexplored mass window.

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