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Dissipative Dark Matter in a Slow Cooker: Delayed Dark Clumps and Primordial Black Holes

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We demonstrate a novel mechanism for forming dark compact objects and black holes through a dissipative dark sector. Heavy dark sector particles can be responsible for an early matter dominated era before Big Bang Nucleosynthesis (BBN). Density perturbations in this epoch can grow and collapse into tiny dissipative dark matter halos, which can cool via self-interactions. Once these halos have formed, a thermal phase transition can then shift the Universe back into radiation domination and standard cosmology. These halos can continue to collapse after BBN, resulting in the late-time formation of fragmented compact MACHOs and sub-solar mass primordial black holes.

Mini Symposia (Invited Talks Only)

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