NEHOP'25 - New Horizons in Primordial Black Hole Physics



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## Memory-burdened Primordial Black Holes as sources of Ultra-High Energy neutrinos.

Tuesday 20 May 2025 10:00 (20 minutes)

In this talk I will address how "memory-burdened" primordial black holes (PBHs) of low mass, evaporating today, could in principle be detected via their neutrino emission.

Using the latest IceCube data, we place novel constraints on the combined parameter space of PBH masses and memory burden effects. Additionally, we explore whether the ultra-high-energy neutrino event recently detected by KM3NeT could originate from an evaporating PBH. We systematically examine the parameter space of burdened PBHs under current constraints on PBH dark matter fraction, and predict the occurrence rate of similar events. Future neutrino telescopes such as IceCube-Gen2 and GRAND will provide crucial tests of these scenarios, with the potential to probe highly suppressed evaporation regimes and light PBH masses.

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