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## Primordial Black Hole probes of Heavy Neutral Leptons

*Monday, 17 June 2024 12:10 (10 minutes)*

In this talk, I will discuss possible probes of Heavy Neutral Leptons (HNLs) with Primordial Black Holes (PBHs).

If produced in the early Universe with an initial mass of  $\sim 10^{15}$  g, PBHs are expected to evaporate at the present time producing sizable

fluxes of particles in their last instants. These “exploding” black holes will emit bursts of Standard Model particles as well as new degrees of freedom, if present.

We explore the possibility that HNLs mixing with the active neutrinos are emitted in the final evaporation stage of PBHs.

We evaluate the active neutrino fluence expected

from such an explosion, to which the decays of the heavy sterile neutrinos contribute through a secondary emission.

We estimate the expected number of muon-neutrino events at IceCube

and we infer sensitivities on the active-sterile neutrino mixing and the sterile neutrino mass.

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