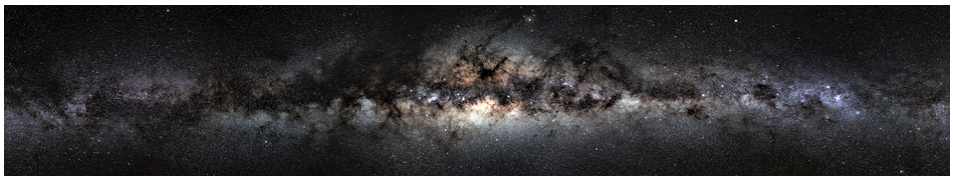

Contribution ID: **75** Type: **Oral**

Primordial Black Hole Dark Matter Evaporating on the Neutrino Floor

Thursday, 9 December 2021 13:08 (18 minutes)

Primordial black holes hypothetically generated in the first instants of life of the Universe are potential dark matter (DM) candidates. Focusing on Primordial black holes masses in the range [5×10^{14}-5×10^{15}]g, we point out that the neutrinos emitted by PBHs evaporation can interact through the coherent elastic neutrino nucleus scattering producing an observable signal in multi-ton Dark Matter direct detection experiments. We show that with the high exposures envisaged for the next-generation facilities, it will be possible to set bounds on the fraction of Dark Matter composed by Primordial black holes improving the existing neutrino limits obtained with Super-Kamiokande. We also quantify to what extent a signal originating from a small fraction of Dark Matter in the form of Primordial black holes would modify the so-called “neutrino floor”, the well-known barrier towards detection of weakly interacting massive particles as the dominant Dark Matter component.

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Session Classification: Parallel 3: Black Holes and Gravitational Waves