Israeli Joint Particle Physics Meetings, Spring-Summer 2020

Contribution ID: 10

Non-Cold Dark Matter from Primordial Black Hole Evaporation

Wednesday 17 June 2020 11:00 (1 hour)

The talk will be given remotely: Join Zoom Meeting https://technion.zoom.us/j/93346299032?pwd=V2JJdmxqM0JkQzBYN2FVS0F4bldjQT09

Meeting ID: 933 4629 9032 Password: HEP_Joint

Abstract: Dark matter coupled solely gravitationally can be produced through the decay of primordial black holes in the early universe. If the dark matter is lighter than the initial black hole temperature, it can be warm enough to be subject to structure formation constraints. I will present an overview of this scenario and discuss some recent progress in calculating the structure formation constraint with greater precision. Taking into account the red-shifted phase space of DM particles from the black hole evaporation, we used the Boltzmann code CLASS to determine the corresponding matter power spectrum, which we find to match closely to those of warm dark matter models. This allowed us to rule out the possibility, consistent with analytic estimates, of primordial black holes having come to dominate the energy density of the universe and simultaneously given rise to all the DM through their decay. Consequences and implications for dark radiation and leptogenesis will be briefly discussed.

Presenter: Dr BALDES, Iason (Universite Libre de Bruxelles)