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Primordial Black Holes as a common origin for baryons and dark matter?

Tuesday 8 December 2020 09:00 (30 minutes)

The origin of the baryon asymmetry of the Universe (BAU) and the nature of dark matter are two of the most challenging problems in cosmology. I will present a scenario in which the gravitational collapse of large inhomogeneities at the QCD epoch generates both the baryon asymmetry and the dark matter in the form of primordial black holes (PBHs). It would naturally explain the observed BAU and why the baryons and dark matter have comparable densities. No parameter fine-tuning is required if the PBHs originate from the fluctuations of a light stochastic spectator field during inflation. The predicted wide mass distribution of PBHs ranges from sub-solar to several hundred solar masses. It can evade the current limits on the PBH abundance and explain the mass, rate and low effective spins of the black hole mergers detected by LIGO-Virgo, as well as a series of cosmic conundrums.

Presenter: CLESSE, Sébastien (Catholic University of Louvain)

Session Classification: Invited talks