Primordial black holes in an early matter-dominated era and stochastic inflation

Wednesday 22 September 2021 16:30 (15 minutes)

We consider the possibility that the majority of dark matter in our Universe consists of black holes of primordial origin. We examine the effects of stochastic inflation and an early matter-dominated era on the abundance of these black holes. We show that the power spectrum of comoving curvature perturbations computed in stochastic inflation matches the result obtained by solving the Mukhanov-Sasaki equation at the linear level, even in the presence of an ultra-slow-roll phase. We also find a significant reduction in the required tuning of the parameters of the inflationary potential in the matter-dominated scenario, in contrast to the standard case of formation during radiation domination. We show that the stochastic background of primordial gravitational waves resulting from this mechanism could be detected by future space-based observatories.

Do you wish to attend the workshop on-site?

yes

Summary

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Session Classification: Parallel Sessions: Cosmology

Track Classification: Cosmology & Astroparticle Physics