

New Horizons in Primordial Black Hole physics (NEHOP)



Contribution ID: 21

Type: **Highlight talk**

Lattice simulation of stochastic inflation

Monday, 19 June 2023 16:40 (10 minutes)

The primordial black hole (PBH), a hypothetical rare object, is one of the candidates for dark matter. This is made by the gravitational collapse of the region of large curvature perturbation. Though one often adopts the perturbation theory for the growth of the fluctuation, it may fail in the case of large perturbation associated with PBHs. This problem is resolved by the non-perturbative approach called stochastic formalism. We focus on the accurate growth of initial density fluctuation with numerical lattice simulation in this formalism. We reduce the number of runs and efficiently focus on large perturbations by the technique of importance sampling. We successfully got the real-space map of large curvature perturbation, which is helpful to accurately discuss the PBH formation.

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Session Classification: Session 4