Contribution ID: **5** Type: **not specified**

Thermal curvature perturbations in thermal inflation

Tuesday 11 April 2023 14:00 (40 minutes)

We compute the power spectrum of super-horizon curvature perturbations generated during a late period of thermal inflation, taking into account fluctuation-dissipation effects resulting from the scalar flaton field's interactions with the ambient radiation bath. We find that, at the onset of thermal inflation, the flaton field may reach an equilibrium with the radiation bath even for relatively small coupling constants, maintaining a spectrum of thermal fluctuations until the critical temperature T_c, below which thermal effects stop holding the field at the false potential minimum. This enhances the field variance compared to purely quantum fluctuations, therefore increasing the average energy density during thermal inflation and damping the induced curvature perturbations. In particular, we find that this inhibits the later formation of primordial black holes, at least on scales that leave the horizon for T > T_c. The larger thermal field variance also reduces the duration of a period of fast-roll inflation below T_c, as the field rolls to the true potential minimum, which should also affect the generation of (large) curvature perturbations on even smaller scales.

Presenter: Mr GOMES, Joaquim M. (University of Liverpool, UK)