Contribution ID: **35** Type: **not specified**

Constraints on Reheating to SM Particles due to Large Effective Higgs Boson Mass

Thursday 24 September 2020 09:00 (20 minutes)

An early period of inflation driven by a rolling scalar field must end by successfully reheating the Universe into the radiation-dominated era before the time of Big Bang Nucleosynthesis. In my talk I consider inflaton decays (both perturbative and resonant) into SM particles, which acquire their mass via couplings to the SM Higgs boson. The particular decays may temporarily be blocked due to the light spectator Higgs field obtaining a large effective VEV from quantum fluctuations during inflation. In the first part of the talk I will present a method of calculating the adiabatic density fluctuations that arise because the Universe exhibits a space-dependent reheat temperature,
due to the correspondingly space-dependent Higgs-induced particle masses. These fluctuations are severely non-Gaussian due to the inherent non-linearity of the reheating process. Results for the non-Gaussianity parameter f_NL are presented in the second part of my talk. Finally, I will show how temperature fluctuations and non-Gaussianity together can provide significantly strong constrains on SM parameters based on Cosmic Microwave Background measurements by Planck.

Authors: Dr VISINELLI, Luca (GRAPPA, University of Amsterdam); Dr STENGEL, Patrick (Stockholm University); SFAKIANAKIS, Evangelos (University of Illinois at Urbana-Champaign); FREESE, Katherine (University of Michigan); Ms LITSA, Aliki (Stockholm University)

Presenter: Dr VISINELLI, Luca (GRAPPA, University of Amsterdam)

Session Classification: CoCo