



Contribution ID : 53

Type : **not specified**

Quantum Hubble horizon

The talk addresses the possibility of obtaining cosmologically relevant effects from the quantum nature of the Hubble horizon. We show that the Planck scale discreteness of the Hubble horizon naturally leads to a mechanism of condensation in the very early Universe. We argue that this provides a possible resolution of the problem of the initial homogeneity at the onset of inflation. Furthermore, we present an analysis in terms of entropy of the quantum Hubble horizon and show that the Λ CDM model may arise from a linearly corrected Bekenstein-Hawking entropy. Based on this, we justify that the current accelerating expansion can be associated with the entropy decrease in the Hubble volume. The results open new ways to explore the relationship between the Planck scale effects and observationally relevant features of our Universe.

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