Contribution ID : **19** Type : **not specified**

The time problem and primordial perturbations

Thursday, 23 March 2023 09:15 (60)

The problem of time in physics arises from the conceptual discrepancies between non-relativistic and relativistic time.
The principle of general covariance in general relativity gives us the freedom to choose an arbitrary clock for our theory. In quantum mechanics, however, different choices of internal time variables are known to produce unitarily inequivalent quantum models.
In my presentation I will propose a fully analytical model of primordial gravitational waves propagating in a Friedman-Lemaitre-Robinson-Walker background with different clocks to study what are (if any) the dynamical predictions of quantum gravity models for large classical universes, which do not depend on the employed time variable.
Solving the Hamiltonian constraint of the model and fixing the internal time variable prior to quantization, we are able to study all the existing clocks and quantize them in a way that ensures a fixed 'operator ordering'. Hence, any quantum ambiguity found is safely ascribed to the different choice of clock.

Presenter(s) : BOLDRIN, Alice (NCBJ)