# Contributed Talk

**Name:** Rafael Jiménez Llamas **Position:** PhD Student

**Affiliation:** Universidad Autónoma de Madrid

**Title:** Effects of a scalar field potential on primordial perturbations in hybrid (loop) quantum cosmology.

**Abstract:** There is an increasing interest in cosmological models with scalar fields that present kinetically dominated phases in their evolution, since these may have played a relevant role in the very early stages of the Universe and lead to modifications in observable quantities, e.g. the cosmic microwave background. The departures of this scenario from standard slow-roll inflation prevent one for employing the approximate analytical formulas for the power spectrum that are valid in slow roll, complicating the calculations, that, in most cases, have to be done numerically. Moreover, the complexity of these calculations increases if the model takes into account the quantum behavior of the background, incorporating it by means of expectation values on the background geometry, as it happens in hybrid quantum cosmology. In this situation, an interesting possibility consists in approximating our description of the perturbations around the free evolution without potential, so that only the knowledge of the dynamics of this particular case is required in full detail. In order to consider the influence of the potential, it is necessary to include the corrections that its presence produces on this free dynamics. We analyze these corrections at dominant order. In principle, the analysis that we present can be extended to cover higher-order corrections as well. In particular, our results facilitate the study of the quantum geometry effects on the primordial perturbations, which, in models as those of LQC, occur in kinematically dominated regimes.