



ID de Contribution: 36

Type: **Oral presentation**

## Probing inflation with cosmological observations

*jeudi 18 mars 2021 14:00 (20 minutes)*

Inflation is a hypothetical very early period of the universe when it was expanding exponentially. It has been introduced to explain the homogeneity and the flatness of the observed universe. Remarkably, inflation provides a very nice explanation for the origin of the tiny fluctuations that we observe in the cosmic microwave background: all the known particles come from one single scalar field decay. These primordial fluctuations are the seeds of structure formation (filaments, clusters, galaxies...). In addition, the study of this epoch gives us a unique probe of very high energy physics of the order of  $10^{15} - 10^{16} GeV$ . We will explain two particularly interesting features of the primordial perturbations: Adiabatic/isocurvature and (non-)Gaussianity. A detection of non-Gaussianity and/or isocurvature modes would be interesting since both could rule out the simple single-field inflation models and demonstrate the presence of multiple fields interacting at very high energy and/or modified gravity. To study these features, we usually look at the statistics of the fields that we can observe: temperature and polarization in the case of the CMB and galaxies and/or distribution of matter in the case of large-scale structure.

### Language

English

### Field

Cosmology

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