ID de Contribution: **47**   Type: **Non spécifié**

Bayesian analysis and Supernova Photometric Cosmology

mercredi 4 mars 2020 17:10 (40 minutes)

In the end of the 20th century type Ia supernovae provided the first evidence for accelerated cosmic expansion – completely changing the cosmological model paradigm. Since then, the astronomical community has devote much of its resources to the construction of large scale sky surveys which are expected to achieve first light in the next few years. The upcoming Large Survey of Space and Time at the Vera Rubin Observatory (LSST) is one of the most ambitious of such experiments. In the new data paradigm raised by the next generation of surveys, which will deliver larger and more complex astronomical data than ever before, the methods of data analysis will need to be adapted to the new reality. In this talk, I will briefly describe the traditional pipeline for supernova cosmology, highlighting the new challenges to be faced and list a number of potential improvements already achieved by the application of Bayesian analysis. In particular, I will focus on how the combination of Bayesian techniques with adaptive machine learning algorithms can enable purely photometric supernova cosmology in the next decade.

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Classification de Session: Invited talk