



## ***ASTROPHYSICS SEMINAR***

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### **Disentangling astrophysical and cosmological B-modes**

#### Abstract

The search for the primordial B-mode polarization of the cosmic microwave background (CMB) radiation, which carries the signature of the primordial gravitational waves from the cosmic inflation epoch, mobilizes the efforts of the worldwide CMB research community. New-generation CMB experiments are being proposed to detect the primordial CMB B-mode signal at a magnitude, called tensor-to-scalar ratio, of  $r < 0.001$ , whose exact value depends on the energy scale of inflation. The search for CMB B-modes is extremely challenging because astrophysical foreground emissions from our Galaxy obscure the cosmological CMB B-mode signal by several orders of magnitude in microwave sky observations, while the exact spectral properties of the foregrounds are also poorly known at sensitivity levels of  $r \sim 0.001$ . I will discuss the problem of foregrounds and component separation for the search for primordial B-modes, and emphasize specific challenges in this context: foreground mismodeling, foreground spectral distortions, spectral degeneracies. To tackle these issues, I will also present a new semi-blind component separation method, in which several constraints are added to the usual Internal Linear Combination (ILC) method in order to deproject the main statistical moments of the foreground emission. I will show how such a new approach provides an interesting avenue for unbiased measurements of the primordial CMB B-modes with future CMB experiments.

**Wednesday    04 May 2022    time 16:30**

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