Direction de la Recherche Fondamentale
IRFU
Département d'Astrophysique

Soutenance d'Habilitation à Diriger des Recherches

COSMOLOGICAL PARAMETERS FROM WEAK COSMOLOGICAL LENSING

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DAp

Mercredi 4 avril 2018 – 14h00 - Salle Galilée – bât 713

In the last two decades, weak gravitational lensing has become a mature and competitive technique to probe the large-scale structure of the Universe and to obtain constraints on the cosmological model. Many ongoing and upcoming large galaxy surveys will map the cosmic web in order to shed light on the accelerated expansion of the Universe and to improve our understanding of the connection between galaxies and dark matter.

In this presentation, I will review my contributions to the field of weak gravitational lensing by the cosmic web. I will discuss results we have obtained from the CFHTLS, CFHTLenS, and COSMOS surveys, including constraints on dark energy and modified gravity. In particular, CFHTLenS conducted ground-breaking work in their data analysis, with a careful quantification of systematics, and the public release of all lensing products that led to many independent third-party publications and results. Some emphasis will be put on the extraction of information from weak-lensing data and the statistical analysis of the observables, in particular when these observables probe the cosmic web on non-linear and non-Gaussian scales.

I will conclude with an outlook of what we can expect from weak lensing in the near future. I will discuss possible solutions to important challenges in the processing and cosmological inference of weak-lensing data from large ongoing and upcoming surveys, such as CFIS and, in particular, Euclid. You are kindly invited to the pot that will follow the decision of the jury (Alain Blanchard, Martin Kunz, Christophe Pichon, Jim Bartlett, Nick Kaiser, Stéphane Plaszczynski).