# Point spread function field interpolation using optimal transport

Ngole Mboula Fred Maurice[*1]

[1]Service d'Astrophysique (SAp) – CEA – Service d'Astrophysique, CEA-Saclay, DSM/DAPNIA/SAp, Bât. 709, L'Orme des Merisiers, F-91 191 Gif-sur-Yvette Cedex, France, France

## Abstract

The weak gravitational lensing is one of the most promising tools to probe the dark matter distribution in the universe. The idea is to infer, from a billion images of galaxies, the shape distortions due to dark matter gravitational lensing and then estimate the dark matter mass density. Therefore It is crucial to correct galaxy images from the anisotropic distortions induced by the telescope point spread function (PSF) accurately. In large scale spatial surveys such as the forthcoming Euclid mission, the PSF varies across the telescope field. In practice, isolated star images will give local estimation of the PSF. Thus, one needs a method to interpolate the PSF field at the galaxies locations. We propose to tackle this by solving of problem of optimal transport under an appropriate geometry. We show on realistic simulated Euclid PSF that our approach performs better than linear interpolation based approaches.

[*]Speaker