

Contributed Talk

Splinter Euclid

WEAK-LENSING SHEAR MEASUREMENT WITH MACHINE LEARNING

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To minimize the statistical uncertainty of the cosmological inference, Euclid will measure weak gravitational lensing using images of $\sim 10^9$ source galaxies. The benefit from this large galaxy population can only be exploited if systematic errors of the shear measurement stay within unprecedented requirements. At the same time, the shear estimation on each source galaxy has to remain CPU-efficient, so that the measurement process remains applicable both to the data and to large simulations for calibration and testing purposes. I will present a supervised machine-learning approach to address this task. Using image simulations, we train artificial neural networks to predict shear estimates for each source galaxy. The networks empirically learn to correct for the PSF, noise bias, pixelization, morphology, and further bias sources on a galaxy-by-galaxy basis, reducing the dependence on prior knowledge of the source galaxy properties.