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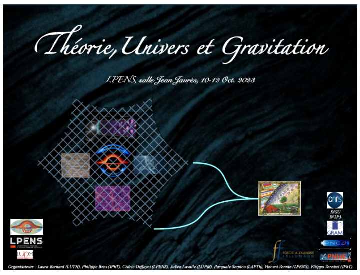


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# Guillermo Franco Abellán (GRAPPA Amsterdam): Accelerating cosmological inference from Euclid with Marginal Neural Ratio Estimation

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The Euclid space telescope will measure the shapes and redshifts of billions of galaxies, probing the growth of cosmic structures with an unprecedented precision. However, the increased quality of these data also means a significant increase in the number of nuisance parameters, making the cosmological inference a very challenging task. Indeed, conventional likelihood-based methods like Markov-Chain Monte Carlo (MCMC) become extremely time-consuming when the dimensionality of the parameter space is very high. In this talk, I discuss the first application of Marginal Neural Ration Estimation (MNRE) (a recent approach in so-called simulation-based inference) to Euclid primary observables, like cosmic shear and galaxy-clustering spectra. Using expected Euclid experimental noise, I show how it's possible to recover the posterior distribution for the cosmological parameters using an order of magnitude fewer simulations than conventional likelihood-based methods.This result supports that MNRE is a powerful framework to analyse Euclid data, allowing to extend the model complexity beyond what its currently achievable with standard MCMC.

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