

From Galaxy clusters to the Epoch of Reionization, an exploration of what ML tools can bring to cosmology and simulations.

Friday, July 11, 2025 4:25 PM (25 minutes)

Machine Learning (ML) as emerged in the last decade as a powerful tool to solve complex, high-dimensional problems. This presentation will cover several aspects of my research related to ML techniques applied to tackle challenges in cosmology. Firstly, I will describe a new method to infer cosmological parameters from X-ray cluster number counts, using full-field emulation and simulation-based inference. Secondly, I will show how this framework can also be applied to radio interferometry, in order to constrain the HI fraction during the epoch of reionization (EoR). Lastly, I will present an alternative path to run cold dark matter simulations with Kolmogorov-Arnold Networks.

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Session Classification: Contributions