Contribution ID: **85** Type: **talk**

Cosmological Reconstructions with Neural Networks: From Data to Theory

Tuesday 2 September 2025 11:35 (35 minutes)

In this talk, I will present a machine learning approach to reconstructing cosmological dynamics using artificial neural networks (ANNs), applied to late-time expansion, structure growth, and scalar-tensor gravity models. This non-parametric method learns directly from observational data—such as cosmic chronometers, BAO, and supernovae—while incorporating realistic uncertainties and correlations. I will highlight results from ΛCDM null tests and demonstrate how ANN-based reconstructions constrain viable scalar-tensor theories, offering a scalable and model-independent route to cosmological inference in the precision era.

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Session Classification: Morning