



MACHINE LEARNING FOR ASTROPHYSICS

2ND EDITION CATANIA, 8-12 JULY, 2024

Contribution ID: 275

Type: **Poster Presentation**

Flash Talk: Morphology and spatial distribution of high-redshift dust emission using component separation and deep learning

Thursday, 11 July 2024 12:50 (5 minutes)

Observations and state-of-the-art cosmological simulations show that there is a lack of low-mass as well as massive galaxies with respect to the number of dark matter halos, in comparison to the theoretical predictions by the Λ CDM model. For the local universe, this discrepancy can be explained by studied baryonic processes, but it is still unclear what causes the dearth of galaxies in the early universe (beyond cosmic noon : $z>3$), as gas and dust had much different physical conditions. Through this PhD thesis, we aim to perform a morphological and kinematic analysis of high-redshift galaxies, focusing on the Hot Dust-Obscured Galaxy (Hot DOG) population to understand the physical dynamics of such systems. Our tentative goals are to use data from simulations as well as observations, and incorporate blind source separation techniques to understand the dynamics of different components of interacting sources at high redshift, coupled with novel deep learning methods to learn about the evolutionary stage in the overall galaxy evolution timeline. This extensive morpho-kinematic study would allow us to explain the respective physical processes better, and close the gap between observations/simulations and theoretical predictions. In this talk I will talk about the premise, goals and progress with my PhD thesis.

Presenter: LAHIRY, Arnab

Session Classification: Cosmology & Simulations