Observing z>9 galaxy candidates through lensing cluster Abell 2744 with JWST

The new era of observation has begun with JWST. The first series of observations has already revealed surprising results regarding high-redshift galaxies. In particular, the number density and stellar mass of these sources defy current theoretical predictions of galaxy formation. While these galaxies might be a particular case of rare enhancement of star formation due to the limited survey area, these exciting findings highlight the potential for JWST to probe the early stages of galaxy formation.

In this presentation I will talk about the results of our new search for high-redshift galaxies at z>9 using ultra-deep NIRCam observations of the lensing cluster Abell 2744 as part of our JWST Cycle 1 program UNCOVER. We used two independent codes BEAGLE and Eazy to identify high-redshift galaxies through photometric redshifts , in combination with dropout selection. We found 15 candidates at $9 < z < 12$ and 3 candidates at $12 < z < 13$, some of those galaxies show not only the Lyman break, but also a Balmer break. I will show our latest estimate of the UV luminosity function at z>9 using a comprehensive set of completeness simulations, which take into account all the lensing effects and systematic uncertainties. Finally, I will discuss the implications of our results regarding recent JWST observations and theoretical predictions.