

PAP301

Seminar in Particle Physics and Astrophysical Sciences

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Galaxy morphology and transformation analysis

It is known that the environment and the properties of the galaxy are correlated. There are many possible processes that may be the cause of the correlation, such as interactions between galaxies and ram pressure stripping. Still more studies are needed to determine the dominant mechanism responsible for the correlation.

In order to understand galaxy formation and evolution, it is necessary to study its structure. There are various ways to measure galaxy structure, including visual morphology, parametric measurements and non-parametric measurements. The parametric measurements of structure are done with light profiles like the Sérsic surface brightness profile. The most common method of measuring non-parametric parameters is the CAS system. This method measures the light concentration (C), the asymmetry index (A), and clumpiness (S).

The focus of my study is to analyze data from the James Webb Space telescope (JWST), and compare its results to a previous analysis done to data from the Hubble Space Telescope (HST). The analysis is done with 2D light fitting program GaLight, allowing its user to fit both parametric and non-parametric quantities. The target galaxies for the studies are from the same catalog, with JWST data at the redshift $z=1.07$ and HST $z=0.2-1$.

The main findings of the analysis done to HST data is that at low stellar mass, blue late disk galaxies dominate further away of the group center, and red bulge+disk galaxies dominate the inner regions. The decline of one galaxy population and the increase of another are in balance, supporting the theory of transformation process.

The analysis is still ongoing, and at the moment I do not have the final results to present.