

Title:

Gas-fuelling: An empirical perspective

Abstract:

Smooth accretion of gas from the inter-galactic medium by galaxies, fueling and sustaining their star formation and growth, is arguably one of the most fundamental processes in galaxy evolution, representing, e.g. the process by which the first galaxies must have grown and evolved, as well as that which has dominated the supply of fuel for star formation in the Universe since cosmic noon, at least. However, although of central importance and accordingly the subject of significant theoretical study, incisive empirical constraints on this fundamental process largely remain lacking.

Here I present the results of a number of novel empirical studies of the process of gas-fuelling making use of the Galaxy Mass Assembly Survey. Surprisingly, we find gas-fuelling to be largely environment independent, even for a majority of satellite disk galaxies contrary to the standard paradigm, and with significant implications for the model of self-regulated star-formation in galaxies. Finally, I highlight recent results on the impact of central AGN on the star formation activity of satellite galaxies and outline how Euclid and JWST in combination with upcoming spectroscopic surveys, will provide the samples (both in numbers and redshift range) to truly incisively address the physical mechanisms underlying gas-fuelling.