The initial supply of gas from which the stars of galaxies are formed must have been accreted from the intergalactic medium (ISM). Arguably, this process of accretion of ISM gas by galaxies is amongst the most fundamental involved in the formation of baryonic structure and, barring major galaxy-galaxy interactions, will determine the evolutionary fate of a galaxy. Accordingly, it has been the focus of much theoretical work, with the currently widely accepted picture being that of a two step accretion: first from the ISM onto the host dark matter halo, forming a virialized intrahalo medium (ICM) and then, via cooling, from the ICM into the ISM of the galaxy (Fig. 1, [2]).

The second step depends on the temperature of the ICM and its ability to cool, so that the efficiency of gas-fueling is expected to decline with increasing halo mass. For low mass galaxies it is believed, that the accretion is balanced by self-regulated stellar feedback removing ISM from the galaxy, while for massive galaxies (which predominantly reside in massive halos) AGN feedback is thought to further suppress accretion leading to a maximum efficiency of ~10^−5 M_solar/yr. Indeed, as can be seen in Fig. 2, the ratio of stellar to dynamical mass for galaxy groups in the Galaxy And Mass Assembly (GAMA) survey [5] approaches the universal baryon mass fraction for low mass halos and declines with increasing mass. Further complexity is added by the hierarchical merging of DM halos giving rise to galaxy groups. For satellite galaxies, i.e. those not in the center of their group, their motion relative to the ICM introduces further processes, e.g. non-pressure stripping which can affect the rate of accretion onto the galaxy. Indeed, until recently, it has generally been assumed that no gas-fueling takes place in satellite galaxies.

It is essential, however, to note that this scenario rests almost solely on theoretical considerations, with little in the way of direct empirical constraints with which to contrast its predictions. We have used the GAMA survey, in particular the GALEX-GAMA UV data and the galaxy group catalog G0-DG [6] to, for the first time, derive direct quantitative empirical constraints on the process of gas-fueling as a function of environment.