Confirming $z \approx 2$ galaxy clusters with HST grism spectroscopy

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Abstract

Galaxy clusters are known to form in the densest regions of the universe. Also, they are the most massive collasped and gravitationally bound structures, being therefore unique laboratories for studying growth of structures over cosmic time. Particularly, among galaxy clusters, the most distant ones are key objects to test different models of structure formation and evolution. Indeed, studying high redshift galaxy clusters and their environments is necessary to reveal how clustured galaxies evolve from young and highly star forming systems to the old and passive structures seen at low redshifts.

Based on the unique Clusters Around Radio-Loud AGN (CARLA; Wylezalek et al., 2013) catalogue in terms of size, depth, and uniformity gathering 420 cluster and proto-cluster candidates obtained from a Spitzer/IRAC survey, I will present the first analyses and results of a Cycle 22 HST follow-up programme targeting the 20 most overdenses CARLA fields. These powerful radio-loud AGN fields had been IRAC-colour-selected to reside at high redshifts in the range $1.3 < z < 3.2$. Newly obtained follow-up data, from WFC3 grism spectroscopy on-board the HST, allow to confirm the redshifts of the sources, and study their galaxy stellar populations, ages, and star formation rate at the time of the clusters' assembly epoch.