

The progenitors of early-type galaxies in clusters and proto-clusters

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Galaxy clusters and proto-clusters are the ideal environments to study the formation and evolution of early-type galaxies, and early probes of cosmology. Clusters at $z \lesssim 1.5$ are shown to host the star forming progenitors of their current red sequence early-type population. The next generation of wide-field infrared space missions, such as WFIRST and Euclid, will permit us to detect and characterize thousands of these massive objects by searching galaxy concentrations in imaging and grism spectroscopy, and study their galaxy properties with the next generation integral field units. We will present our recent cluster and protocluster detections in the HST CDF-S, CANDELS and SSDF fields using deep observations with Spitzer, the HST/WFC3 grism spectroscopy and VLT/KMOS IFU spectroscopy. We will discuss our results in terms of galaxy evolution and the formation of the massive early-type progenitors.