National University, Republic of Korea
[2]AIP, Potsdam, Germany

Ultra-diffuse galaxies (UDGs) are an unusual galaxy population. They are ghostlike galaxies with fainter surface brightness than normal dwarf galaxies, but they are as large as MW-like galaxies. The key question on UDGs is whether they are 'failed' giant galaxies or 'extended' dwarf galaxies. To answer this question, we study UDGs in massive galaxy clusters. We find an amount of UDGs in deep HST images of three Hubble Frontier Fields clusters, Abell 2744 (z=0.308), Abell S1063 (z=0.347), and Abell 370 (z=0.374). These clusters are the farthest and most massive galaxy clusters in which UDGs have been discovered until now. The color-magnitude relations show that most UDGs have old stellar population with red colors, while a few of them show bluer colors implying the existence of young stars. The stellar masses of UDGs show that they have less massive stellar components than the bright red sequence galaxies. The radial number density profiles of UDGs exhibit a drop in the central region of clusters, suggesting some of them were disrupted by strong gravitational potential. Their spatial distributions are not homogeneous, which implies UDGs are not virialized enough in the clusters. With virial masses of UDGs estimated from the fundamental manifold, most UDGs have M_200 = 10^10 - 10^11 M_Sun indicating that they are dwarf galaxies. However, a few of UDGs more massive than 10^11 M_Sun indicate that they are close to failed giant galaxies.

[구 GC-04] Star formation in high redshift early-type galaxies

Raphael Gobat[1], Emanuele Daddi[2], Georgios Magdis[3], Frederic Bournaud[2], Mark Sargent[4], Marie Martig[2], Shuowen Jin[2], Ho Seong Hwang[1]
[1]KIAS (Korea), [2]CEA Saclay (France), [3]Dark Cosmology Centre (Denmark), [4]University of Sussex

Massive early-type galaxies (ETG) have been spectroscopically confirmed up to z>3 which, together with their ages and abundances at z>1.5, implies that their progenitors must have converted gas into stars on short timescales. The termination of star formation in these galaxies can occur through several channels, but they remain largely conjectural, in part due to the current lack of direct measurements of the amount of residual gas in high redshift ETGs. Here I will present constraints on the star formation rate and dust/gas content of z=1.4-2.5 ETGs. These galaxies, close to their epoch of quenching, contained more than 2 orders of magnitude more dust than their local counterparts, which suggests the presence of substantial amounts of gas and a low star formation efficiency.

[구 GC-05] Star-formation Properties of High-redshift (z~1) Galaxy Clusters Connected to the Large-scale Structure

Seong-Kook Lee[1], Myungshin Im1, Minhee Hyun[1], Bomi Park[2], Jae-woo Kim[3], Dohyung Kim[1], Yongjung Kim[1]
[1]Center for the Exploration of the Origin of the Universe, Department of Physics and Astronomy, Seoul National University,
[2]Department of Astronomy and Space Science, Kyung Hee University,
[3]Korea Astronomy and Space Science Institute

At local, majority of galaxies in the dense environment, such as galaxy cluster, are red and quiescent with little star-formation (SF) activity.

However, a different picture emerges as we go to high redshift: (1) there exist non-negligible fraction of galaxies still forming stars actively even in dense environment, and (2) there is a significant cluster-by-cluster variation in the SF properties, such as quiescent galaxy fraction.

In this presentation, we show the results of our study about the variation of quiescent galaxy fraction among high-redshift (z~1) galaxy clusters, based on the multi-object spectroscopic (MOS) observation with IMACS on the Magellan telescope.

Our main result is that galaxy clusters which are connected with significant large-scale structure (LSS), well beyond the cluster scale, are more active in their SF activity, i.e., the quiescent galaxy fraction for these clusters is lower compared to the clusters which are detached from LSS.

~~[구 GC-06] Discovery of a Protocluster associated with a Lyα Blob Pair at z=2.3~~

~~Yujin Yang[1], Toma Bădescu[2], Frank Bertoldi[2], Ann Zabludoff[3], Alexander Karim[2], Benjamin Magnelli[2]~~
~~*[1]KASI, [2]Affiliation Argelander Institut für Astronomie, Universität Bonn, [3]Steward Observatory, University of Arizona*~~

~~Bright Lyα blobs often reside in overdensities of compact Lyα emitters (LAEs) that may be galaxy protoclusters. The number density, variance, and internal kinematics of LABs suggest that they~~