

[박GC-11] Galaxy clustering from the UKIDSS DXS

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Recent wide and deep surveys allow us to investigate the large scale structure of the Universe at high redshift. We present studies of the clustering of high redshift galaxies, using reprocessed UKIDSS DXS catalogue.

We measure the angular correlation function of high redshift galaxies which is Extremely Red Objects (EROs). Firstly we found that their angular correlation functions can be described by a broken power-law. We also found that red or bright samples are more strongly clustered than those having the opposite characteristics, and that old, passive EROs are found to be more clustered than dusty, star-forming EROs. Additionally the average halo mass and other properties were estimated using the halo model. Finally the observed clustering of EROs was compared with predictions from the cosmological simulation.

[박GC-12] On the Formation of Red-sequence Galaxies in Rich Abell Clusters at $z \lesssim 0.1$

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The aim of this study was to explore the role of galaxy mergers on the formation and evolution of galaxies in galaxy clusters. For this purpose, u', g', r' deep optical imaging and multi-object spectroscopic observation were done for four rich Abell clusters at $z \lesssim 0.1$ (A119, A2670, A3330, and A389) with a MOSAIC 2 CCD and Hydra spectrograph mounted on a Blanco 4-m telescope at CTIO. With the deep images, we found that about 25% of the bright red-sequence galaxies exhibited post-merger signatures in a cluster environment. This fraction was much higher than what was expected from the results of the field environment ($\sim 35\%$, van Dokkum 2005) and significantly low on-going merger fractions (about one-fifth of the field) appeared in the clusters currently. Taking advantage of the most up-to-date semi-analytic model, the results indicate that most of the post-merger galaxies may have carried over their merger features from their previous halo environment. All the brightest cluster galaxies in our cluster samples revealed faint structures in their halos as well as multiple nuclei in their centers seen in the deep optical images. We suggest that the mass of the BCGs increased mainly through major mergers at recent epochs based on their post-merger signatures and the large gaps in the total magnitudes between the BCGs and the second-rank BCGs. A UV bright tidal tail and tidal dwarf galaxy (TDG) candidates around the post-merger galaxy, NGC 4922, were discovered in the outskirts of the Coma cluster using the GALEX UV data. We did two-component stellar population modeling for the TDG candidates and the results indicate that they are an early form of dwarf galaxies frequently found around massive early-type galaxies in clusters. In conclusion, we suggest that the mergers of galaxies are an important driving force behind galaxy formation and evolution in cluster environments even until recent epochs.