In studying the dynamical evolution of galaxy clusters, one intriguing approach is to compare the spatial distributions of various components, such as the dark matter, the member galaxies, the gas, and the intracluster light (ICL; the diffuse light from stars, which are not bound any individual cluster galaxy). If we find a visible component whose spatial distribution coincides with the dark matter distribution, then we could draw a dark matter map without requiring laborious weak lensing analysis. Furthermore, if the component traces the dark matter distribution better for more relaxed galaxy cluster, we could use the similarity as a dynamical stage estimator of the galaxy cluster. We present a novel new methodology to quantify the similarity of two or more 2-dimensional spatial distributions. We apply the method to a sample of galaxy clusters at different dynamical stages simulated within N-cluster Run, which is an N-body simulation using the galaxy replacement technique. Among the various components (stellar particles, galaxies, ICL), the velocity defined ICL+ brightest cluster galaxy (BCG) component traces the dark matter best. Between the sample galaxy clusters, the relaxed clusters show stronger similarity of the spatial distribution between the dark matter and ICL+BCG than the dynamically young clusters.

[포 GC-03] Large Scale Structures at z~1 in SA22 Field and Environmental Dependence of Galaxy Properties

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We study galaxy evolution with the large-scale environment with confirmed galaxy clusters from multi-object spectroscopy (MOS) observation. The observation was performed with Inamori Magellan Areal Camera and Spectrograph (IMACS) mounted on the 6.5 m Magellan/Baade telescope in Las Campanas Observatory. With the MOS observation, we spectroscopically confirm 34 galaxy clusters, including three galaxy clusters discovered in Kim et al. (2016) and 11 of them have halo mass of > $10^{14.5}$ $M_{\odot}$. Among the confirmed clusters, 12 galaxy clusters are part of large-scale structure at z ~ 0.9, and their size stretches to 40 Mpc co-moving scale. In this study, we checked the 'web feeding model,' which postulates that more linked (with their environment) galaxy clusters have less quenched populations by investigating the correlation between properties of confirmed galaxy clusters and the large-scale structure environment. Lastly, we found that galaxy clusters that make up the large-scale structure have larger and widely spread values of total star formation density ($\Sigma SFR/M_{halo}$) than typical clusters at similar redshifts.

[포 GC-04] Discovery of Massive Galaxy Cluster Candidates in the Southern Sky

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Galaxy clusters are the largest structures in the universe located at the top of the cosmological hierarchical model, so the evolution of the universe can be understood by studying clusters of galaxies. Therefore, finding a larger number of galaxy clusters plays an important role in exploring how the universe evolves. A large number of catalogs for galaxy clusters in the northern sky have been published; however, there are few catalogs in the southern sky due to the lack of wide sky survey data. KMTNet Synoptic Survey of Southern Sky(KS4) project, which observes a wide area of the southern sky about 7000 deg^2 with KMTNet telescopes for two years, is in progress under the SNU Astronomy Research Center. We use the KS4 multi-wavelength optical data and measure photometric redshifts of galaxies for finding galaxy clusters at redshift z<1. Currently, the KS4 project has observed approximately 50% of the target region, and a pipeline that measures photometric redshifts of galaxies has been created. When the project is completed, we expect to find more than a hundred thousand galaxy clusters, and this will improve the study of galaxy clusters in the southern sky.

[포 GC-05] HI superprofiles of galaxies from THINGS and LITTLE THINGS

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We present a novel profile stacking technique based on optimal profile decomposition of a 3D spectral line data cube, and its performance test using the HI data cubes of sample galaxies from HI