[구GC-25] Quantifying galactic morphological transformations in the cluster environment

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We study the effects of the cluster environment on galactic morphology by defining a dimensionless angular momentum parameter ld, to obtain a quantitative and objective measure of galaxy type. The use of this physical parameter allows us to take the study of morphological transformations in clusters beyond the measurements of merely qualitative parameters, e.g. S/E ratios, to a more physical footing. To this end, we employ an extensive SDSS sample, with galaxies associated with Abell galaxy clusters. The sample contains 93 relaxed Abell clusters and over 34,000 individual galaxies. We find that the median ld value tends to decrease as we approach the cluster center, with different dependences according to the mass of the galaxies and the hosting cluster; low and intermediate mass galaxies showing a strong dependence, while massive galaxies seems to show, at all radii, low ld values. By analysing trends in ld as functions of the nearest galactic neighbour environment, clustercentric radius and velocity dispersion of clusters, we can identify clearly the leading physical processes at work. We find that in massive clusters (s > 700 km/s), the interaction with the cluster central region dominates, whilst in smaller clusters galaxy-galaxy interactions are chiefly responsible for driving galactic morphological transformations.

[구GC-26] On the evolution of the galaxy morphology in the hierarchical universe

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We have investigated the evolution of the galaxy morphology in the hierarchical universe taking advantage of Semi-Analytic Model (SAM). It is well known that the galaxy morphology is related to the dynamical and the chemical evolution. This implies that we need to understand overall physical processes in the galaxy to reproduce its morphology. Thus we implemented gradual hot gas stripping of satellite galaxies in a galaxy cluster and recycling of stellar mass losses into our model in order to describe star formation rate of galaxies accurately. To morphologically classify galaxies, the evolution of disc and bulge components is traced carefully. We compute our models based on the dark matter halo merger trees generated by N-body simulations as well as the Extended Press-Schechter (EPS) formalism. We present morphological differences caused by the use of different merger trees.