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We explored the GALEX UV properties of optical red sequence galaxies in 4 rich Abell clusters at z ~ 0.1. In particular, we tried to find a hint of merger-induced recent star formation (RSF) in red sequence galaxies. Based on the NUV − r' colors of the galaxies, about 36% of the post-merger galaxies were classified as RSF galaxies with a conservative criterion (NUV − r' ≤ 5), and that number was doubled (~ 72%) when using a generous criterion (NUV − r' ≤ 5.4). Post-merger galaxies with strong UV emission showed more violent, asymmetric features on the deep optical images. Also it turned out that all massive RSF galaxies (Mr' < -22 and NUV − r' ≤ 5) exhibited post-merger signatures. Our results suggested that only 30% of RSF red sequence galaxies show morphological hints of recent galaxy mergers. This implies that internal processes (e.g., stellar mass-loss or hot gas cooling) for the supply of cold gas to early-type galaxies may play a significant role in the residual star formation of early-type galaxies at a recent epoch.

[구 GC-08] Merger Induced Kinematic Anomalies in Abell 119

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Galaxy clusters are the sites where the most massive galaxies are found, and so the most dramatic merger histories are embedded. Our deep (mu ~ 28 mag/arcsec^2) images of Abell 119 at z = 0.044 using the Blanco 4-m telescope at CTIO revealed post-merger signatures in ~35% of galaxies brighter than Mr < -19.5, suggesting that so many galaxies even in clusters have gone through galaxy mergers at recent epoch. We went further to understand the impact of mergers in cluster galaxies using stellar kinematics from the SAMI Integral Field Unit on the galaxies of Abell 119 in three aspects of kinematics : orientations, levels of rotation, and kinematic shapes. We found that 30% of the merger-featured galaxies show misalignment in the angle between the photometric major and the rotation axes, and most of them show complex kinematics. For comparison, only 5% of non-merger-featured galaxies show the misalignment. Moreover, our analysis using the Tully-Fisher relation shows that galaxy interactions can both enhance or reduce galaxy spin depending on the merger geometry. We present our preliminary result and discussion on the role of galaxy mergers in cluster environment from the perspective of kinematics.

[구 GC-09] Investigating X-ray cavities and the environmental effects

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X-ray cavities are typically detected as surface brightness depression in X-ray diffuse emission from hot gas in high resolution X-ray images (i.e., Chandra and XMM-Newton). Showing the coincidence of location with radio jets, X-ray cavities imply that the radio jets interact with interstellar/intergalactic medium. It is important to understand them since they can be a clue of understanding AGN feedback to their host galaxies. To understand the physics of the AGN feedback, X-ray cavity has been actively studied while there are only a few statistical studies on X-ray cavity based on small or incomplete samples. Hence, a systematic study with a large sample is needed. With the condition of sufficient X-ray photons to detect surface brightness depression, we constructed a large sample of 133 galaxy clusters, galaxy groups, and individual galaxies to investigate X-ray cavities. We detected 201 cavities from 94 objects using two detection methods (i.e., beta-modeling and unsharp masking method), and confirmed the cavity size-distance relation over a large dynamical range. The size-distance relation does not vary for different environments (i.e., galaxy cluster, groups, and individual galaxies), suggesting that there is little environmental effect on the formation of X-ray cavity.

[구 GC-10] Phase Space as a Tool for Understanding Galaxy Cluster Environmental Effects

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A galaxy-cluster phase space diagram is a simple plot of clustocentric velocity versus clustocentric radius for each member of the cluster. Using state-of-the-art, cosmological