structural and photometric properties of dwarf candidates such as effective radius, central surface brightness, Sérsic index, and absolute magnitude appear to be consistent with those of known dwarf galaxies in nearby groups and clusters, except for color. NGC 1291, residing in a relatively isolated environment, tends to accompany bluer dwarf galaxies (<B-V>≃0.58) than those in denser environment. It shows that the quenching of dwarfs is susceptible to the environment.

[구 GC-10] Cosmological Origin of Satellites around Isolated Dwarf Galaxies

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We trace the cosmological origin of satellites around isolated dwarf galaxies using a very high resolution (12 pc/h) cosmological hydrodynamic zoom simulation. To realistically describe the formation and evolution of small-mass stellar satellites, our model includes a full baryonic physics treatment. We find that the mini-halos form objects resembling dwarf galaxies. The majority of their star forming gas is accreted after reionization, thus the survival of a mini-halo's gas to reionization is not an important factor. Instead, the key factor seems to be the ability for a mini-halo to cool its recently accreted gas, which is more efficient in more massive halos. Although the host galaxy is only a dwarf galaxy itself, we find that ram pressure is an efficient means by which accreted mini-halos lose their gas content, both by interacting with hot halo gas but also in direct collisions with the gas disk of the host. The satellites are also disrupted by the tidal forces near the center of the host galaxy. Compared to the disrupted satellites, surviving satellites are relatively more massive, but tend to infall later into the host galaxy, thus reducing the time they are subjected to destructive environmental mechanisms and dynamical friction.

[구 GC-11] Discovery of the prominent radio relics in the cluster merger ZwCL J1447+2619

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Diffuse radio emissions at the outskirt of merging galaxy clusters called radio relics provide a unique channel to understand the merger history. We present a recent discovery of double radio relics in the cluster merger ZwCL1447+2619 from our recent Giant Metrewave Radio Telescope observations. Both Band 3 (300-500 MHz) and Band 4 (550-850 MHz) data reveal a large (~1Mpc) and thin (~40kpc) radio relic ~1Mpc from the cluster X-ray center and a small radio relic (~0.3 Mpc) on the opposite side. These remarkable radio data together with Subaru weak-lensing analysis and Chandra X-ray observations enable us to reconstruct the merger scenario. Our preliminary analysis suggests that the cluster ZwCL J1447+2619 is a post-merger near its returning phase. In addition, using Keck DEIMOS spectroscopy, we find many “green” and “blue” member galaxies are located between the radio relics, a possible indication of merger shock-driven star formation activities.

[박 GC-12] Deep Impact: Molecular Gas Properties under Strong Ram Pressure Probed by High-Resolution Radio Interferometric Observations

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Ram pressure stripping due to the intracluster medium (ICM) is an important environmental process, which causes star formation quenching by effectively removing cold interstellar gas from galaxies in dense environments. The evidence of diffuse atomic gas stripping has been reported in several HI imaging studies. However, it is still under debate whether molecular gas (i.e., a more direct ingredient for star formation) can be also affected and/or stripped by ram pressure. The goal of this thesis is to understand the impact of ram pressure on the molecular gas content of cluster galaxies and hence star formation activity. To achieve this, we conducted a series of detailed studies on the molecular gas properties of three Virgo spiral galaxies with clear signs of active HI gas stripping (NGC 4330, NGC 4402, and NGC 4522) based on high-resolution CO data obtained from the Submillimeter Array (SMA) and Atacama Large Millimeter/submillimeter Array (ALMA). As a result, we find the evidence that the molecular gas disk also gets affected by ram pressure in similar ways as HI even well inside of the stellar disk. In addition, we detected extraplanar 13CO clumps in one of the sample, which is the first case ever reported in ram pressure stripped galaxies. By analyzing multi-wavelength data (e.g., Hα, UV, HI, and CO), we discuss detailed processes of how ram pressure affects star formation activities and