University

Recent galaxy simulations suggest several scenarios in which the inner structure of late-type galaxies (LTGs) is linked to global quenching. Exactly what mechanism governs the bulge quenching is, however, still under debate due to the lack of observational clues. In this study, we utilize a sample of ~1,300 LTGs in the local universe ($0.02 < z < 0.2$) from SDSS 7, and classify them into star-forming, AGN-hosting, and composite types and into barred and unbarred galaxies. We also examine each subgroup's specific star forming rate (sSFR), stellar mass and compactness using a data set matched with the advanced sSFR catalog by Chang et al. (2015). We find that while star-forming and composite galaxies show no detectable difference between barred and unbarred galaxies, barred AGNs have much lower sSFR than unbarred AGNs at given stellar mass and compactness, Such tendency is stronger for more massive and/or more concentrated galaxies. The results indicate that most AGN-driven quenching is triggered by growth of the bar structure, consistent with the previous simulations of bars.

[포 GC-02] Disruption time scale of merged halos in a dense cluster environment

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To obtain a reliable estimate of the cold dark matter (CDM) substructure mass function in a dense cluster environment, one needs to understand how long a merged halo can survive within the host halo. Measuring disruption time scale of merged halos in a dense cluster environment, we attempt to construct the realistic CDM mass function that can be compared with stellar mass functions to get a stellar-to-halo mass ratio. For this, we performed a set of high-resolution simulations of cold dark matter halos with properties similar to the Virgo cluster. Field halos outside the main halo are detected using a Friend-of-Friend algorithm with a linking length of 0.02. To trace the sub-halo structures even after the merging with the main halo, we use their core structures that are defined to be the most 10% bound particles.

[포 GC-03] Recent results of a KVN key science program: iMOGABA

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We present recent results of very long baseline interferometry (VLBI) observations of gamma-ray bright active galactic nuclei (AGNs) using Korean VLBI Network (KVN) at 22, 43, 86, and 129~GHz bands, which are part of a KVN key science program; Interferometric Monitoring of Gamma-ray Bright AGNs (iMOGABA). We selected a total of 34 radio-loud AGNs of which 30 sources are gamma-ray bright AGNs, including 24 sources monitored by the Fermi Gamma-ray Space Telescope using the Large Area Telescope on board. The selected sources consist of 24 quasars, 7 BL Lacs, and 3 radio galaxies. In this talk, we summarize recent results of the iMOGABA, including results of single-epoch multi-frequency VLBI observations of the target sources, conducted during a 24-hr session on 2013 November 19 and 20. All observed sources were detected and imaged at all frequency bands with or without a frequency phase transfer technique which enabled to detect and image 12 faint sources at 129 GHz, except for 0218+357 which was detected for only one baseline at all frequency bands.

[포 GC-04] KYDISC program : Galaxy Morphology in the Cluster Environment

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Galaxy morphology involves complex effects from both secular and non-secular evolution of galaxies. Although it is a final product of galaxy evolution, it gives a clue to the processes that the a galaxy has gone through. Galaxy clusters are the sites where the most massive galaxies are found, and thus the most dramatic merger histories are embedded. Our deep imaging program (μ ~ 28 mag arcsec^{-2}), KASI-Yonsei Deep Imaging Survey for Clusters (KYDISC), targets 14 Abell clusters at z = 0.016 - 0.14 using IMACS/Magellan telescope and MegaCam/CFHT to investigate cluster galaxies especially on low surface brightness features related to galaxy interactions. We visually classify

galaxy morphology based on criteria related to secular or merger related evolution and find that the morphological mixture of galaxies varies considerably from cluster to cluster. Moreover it depends on the characteristics (e.g. cluster mass) of cluster itself which implies that environmental effects in cluster scale is also an important factor to the evolution of galaxies together with intrinsic (secular) and galaxy merger. Our deep imaging survey for morphological inspection of cluster galaxies with low surface brightness is expected to be a useful basis to understand the nature of cluster galaxies and their internal/external evolutionary path.

[포 GC-05] Updating calibration of CIV-based single-epoch black hole mass estimators

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Black hole (BH) mass is a fundamental quantity to understand BH growth, galaxy evolution, and connection between them. Thus, obtaining accurate and precise BH mass estimates over cosmic time is of paramount importance. The rest-frame UV CIV λ1549 broad emission line is commonly used for BH mass estimates in high-redshift AGNs (i.e., $2 \lesssim z \lesssim 5$) when single-epoch (SE) optical spectra are available. Achieving correct and accurate calibration for CIV-based SE BH mass estimators against the most reliable reverberation-mapping based BH mass estimates is thus practically important and still useful. By performing multi-component spectral decomposition analysis to obtained high-quality HST UV spectra for the updated sample of local reverberation-mapped AGNs including new HST STIS observations, CIV emission line widths and continuum luminosities are consistently measured. Using a Bayesian hierarchical model with MCMC sampling based on Hamiltonian Monte Carlo algorithm (Stan NUTS), we provide the most consistent and accurate calibration of CIV-based BH mass estimators for the three line width characterizations, i.e., full width at half maximum (FWHM), line dispersion (σ_{line}), and mean absolute deviation (MAD), in the extended BH mass dynamic range of $\log M_{BH}/M_{\odot}$ = 6.5-9.1.

[포 GC-06] Gravitational Instability of Rotating Isothermal Rings

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Nuclear rings at centers of barred galaxies exhibit strong star formation activities.

They are thought to undergo gravitational instability when sufficiently massive. We approximate them as rigidly-rotating isothermal objects and investigate their gravitational instability. Using a self-consistent eld method, we first construct their equilibrium sequences specified by two parameters: α corresponding to the thermal energy relative to gravitational potential energy, and R_B measuring the ellipticity or ring thickness. The density distributions in the meridional plane are steeper for smaller α, and well approximated by those of infinite cylinders for slender rings. We also calculate the dispersion relations of nonaxisymmetric modes in rigidly-rotating slender rings with angular frequency Ω and central density ρ_c. Rings with smaller are found more unstable with a larger unstable range of the azimuthal mode number. The instability is completely suppressed by rotation when Ω exceeds the critical value. The critical angular frequency is found to be almost constant at $0.7(G\rho_c)^{1/2}$ for $\alpha > 0.01$ and increases rapidly for smaller α. We apply our results to a sample of observed star-forming rings and confirm that rings without a noticeable azimuthal age gradient of young star clusters are indeed gravitationally unstable.

[포 GC-07] A case study of extraplanar molecular gas in a Virgo spiral using the ALMA

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NGC 4522 is a spiral galaxy located in the Virgo cluster which appears to be undergoing active ram pressure stripping due to the intracluster medium (ICM). What makes this galaxy special is the extraplanar CO gas, some of which coincides with the extraplanar Hα patches. As one of the few cases where the interstellar molecular gas is thought to have been pushed out from the stellar disk by the ICM, this galaxy provides an opportunity to study the impact of ICM pressure on the dense/star forming gas and its fate in the extraplanar space after stripping. In order to probe detailed molecular gas properties inside and