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The surface brightness fluctuation (SBF) is one of the most crucial distance indicators for unresolved stellar systems at large distances. Here, we present an evolutionary population synthesis model of the surface brightness fluctuation (SBF) for normal and He-enriched simple stellar populations (SSPs). Our SBF model for the normal-He population agrees well with other existing models, but the He-rich populations bring about a substantial change in the SBF of SSPs. Our normal-He SBF model well reproduces the observed SBFs of the Milky Way globular clusters, but the SBFs of early-type galaxies in the Virgo Cluster are placed between the normal-He and He-rich SBF models. We show that the SBF-based distance estimation would be affected by up to a 10-20% level in *I*- and near-IR bands at given colors. Finally, we propose that when combined with independent metallicity and age indicators such as Mg2 and Hβ, the UV and optical SBFs can readily detect underlying He-rich populations in unresolved stellar systems. Given the degree of the SBF variation resulting from the population difference, we suggest that the distance measurement before the proper in-depth analysis of stellar populations should be done with great caution.

[구 GC-08] H0 Determination Using TRGB Distances to the Virgo Infalling Galaxies

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An independent determination of H0 is crucial given the growing tension of the Hubble constant (H0). In this work, we present a new determination of H0 using velocities and Tip of the Red Giant Branch (TRGB) distances to 33 galaxies in front of the Virgo Cluster. We model the infall pattern of the local Hubble flow modified by the Virgo mass, as a function of the H0, the radius of the zero-velocity surface R0, and the intrinsic velocity scatter. Fitting velocities and TRGB distances of 33 galaxies to the model, we obtain H0 = 65.6 +/- 3.4 (stat) +/- 1.0 (sys) km/s/Mpc and R0 = 6.96 +/- 0.35 Mpc. Our local H0 is consistent with the global H0 determined from cosmic microwave background radiation, showing no tension.

[구 GC-09] A Survey of Globular Cluster Systems of Massive Compact Elliptical Galaxies in the Local Universe

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Massive Compact Elliptical Galaxies (MCEGs) found in the local universe are as massive as normal galaxies but extremely compact ($M_* > 10^{11}$ M_{sun}, R_{eff} < 1.5 kpc). They are considered to be the relics of red nugget galaxies found at high redshift. They are not likely to have undergone many mergers, keeping their original mass and size. Moreover, it is expected that they host a dominant population of red (metal-rich) globular clusters rather than blue (metal-poor) ones. Indeed, Beasley et al. (2018) found that the color distribution of the cluster system of NGC 1277 is unimodal, showing only a red population. However, NGC 1277 is the only case whose cluster system was studied among MCEGs. In this study, we investigate globular cluster systems of 14 nearby MCEGs with a homogeneous data set of HST/WFC3 F814W/F160W archive images. We detect tens to hundreds of globular clusters in each galaxy and examine their color distributions. Surprisingly, the fractions of red globular clusters are similar to those of normal galaxies, and are much lower than that of NGC 1277. We additionally obtain Gemini/GMOS-N g'r'i' images of PGC 70520, one of the 14 nearby MCEGs, to detect more globular clusters from deeper and wider images. We will discuss the results from the Gemini data combined with the results from the HST data in relation with the formation of MCEGs.

[구 GC-10] A GMOS/IFU Spectroscopic Mapping of Jellyfish Galaxies in Extremely Massive Galaxy Clusters

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Jellyfish galaxies show spectacular features such as star-forming knots and tails due to strong ram-pressure stripping in galaxy clusters. Thus, jellyfish galaxies are very useful targets to investigate the effects of ram-pressure stripping on the star formation activity in galaxies. Integral field spectroscopy (IFS) studies are the best way to study star formation in jellyfish galaxies, but they have been limited to those in low-mass galaxy clusters until now. In this study, we present a Gemini GMOS/IFU study of three jellyfish galaxies in very massive clusters (M_200 > 10^15 Mo). The host clusters (Abell 2744, MACSJ0916.1-0023, and MACSJ1752.0+4440) are X-ray luminous and dynamically unstable, suggesting that

ram-pressure stripping in these clusters is much stronger than in low-mass clusters. We present preliminary results of star formation rates, kinematics, dynamical states, and ionization mechanisms of our sample galaxies and discuss how ram-pressure stripping relates with the star formation activity of jellyfish galaxies in massive clusters.

[구 GC-11] Ram pressure stripping conditions : Theory vs. Observation

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Ram pressure stripping (RPS) which is known to be one of the key effects that can remove the interstellar gas in the dense environment, can be described as a simple momentum transfer relation (Gunn & Gott 1972). However, it has been suggested that the actual gas stripping process is likely more complicated than Gunn & Gott's prescription due to the complexity of gas physics such as compression, cooling and heating. By comparing the gas truncation radius predicted by theory with the stripping radius measured from the HI observation of Virgo cluster galaxies, we attempt to verify how well the RPS process can be understood by momentum transfer alone. Among the sample of galaxies undergoing active RPS, we generally find a good agreement between what is predicted and what is observed within the measurement uncertainties. However, those galaxies with the signs of other environmental effects than RPS such as tidal interaction, and/or the ones likely at relatively early or later stages of RPS show some offsets between the theory and the observation. These results imply that Gunn & Gott's formula works reasonably well in a broad sense when the RPS is a dominant process and the surrounding environment at the current location of the sample can be well defined. Otherwise, the impact of the second mechanism, as well as the (current and past) environment of the sample, should be more carefully reviewed to assess the impact of RPS on galaxy evolution.

[구 GC-12] The Molecular Gas Kinematics of HI Monsters

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Our HI monster sample is a set of local HI-rich galaxies identified by the ALFALFA survey (Arecibo Legacy Fast Survey ALFA) at z<0.08. Intriguingly, they are also found with a relatively large molecular gas reservoir compared to the galaxies with similar stellar mass and color, yet their star formation rate is quite comparable to normal spirals. This makes our HI monsters good candidates of galaxies in the process of gas accretion which may lead to the stellar mass growth. One feasible explanation for their relatively low star formation activity for a given high cool gas fraction is the gas in monsters being too turbulent to form stars as normal spirals. In order to verify this hypothesis, we probe the molecular gas kinematics of 10 HI monsters which we observed using the Atacama Large Millimeter/sub-millimeter Array (ALMA). We utilize the tilted ring model to investigate what fraction of the molecular gas in the sample is regularly and smoothly rotating. In addition, we model the molecular gas disk using the GALMOD package of the Groningen Image Processing System (GIPSY) and compare with the observations to identify the gas which is offset from the 'co-planar differential rotation'. Based on the results, we discuss the possibility of gas accretion in the sample, and the potential origin of non-regularly rotating gas and the inefficient star formation.

[구 GC-13] Physical Origin of the Planar Alignment of Satellite Galaxies

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The Milky Way (MW) and other systems including M31 and Cen A have flattened structures of their satellites (Disk of Satellites, DoS). Such structures are rare in simulations under the ΛCDM paradigm. DoS is known to depend mainly on 1) the alignment of satellite orbits and 2) the degree of central concentration of satellites. In this work, we examine quantitatively how these two parameters affect the flatness of a system. We find that the MW-like DoS is rare in IllustrisTNG100 simulation because its two parameters are out of the 1-s range and furthermore the MW has a structure more flattened than the other systems having similar parameters. Besides, we propose a new criterion for the MW-like systems superseding the conventional ones such as major-minor axis ratio