with clusters identified in the X-ray extended source catalog. Furthermore, we identify galaxy large scale structures, and will present the correlation or anti-correlation between quiescent galaxy fraction, an indicator of star-forming activity, and the prevalence of galaxy large scale structures.

[포 GC-04] NewHorizon: On the Quenching Mechanisms of the Dwarf Galaxies

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Dwarf galaxies are the most abundant objects in the universe. Hence, understanding the dwarfs is important but relatively little is known due to the lack of computing power and limitations in the telescope resolution. We thus use the state-of-the-art NewHorizon simulation, which is a set of cosmological hydrodynamical simulations, to dissect the quenching mechanism working on dwarf galaxies by inspecting the star formation and mass history of individual galaxies. It is known that internal (AGN, SN, stellar feedback) and external (major and minor mergers, ram pressure stripping, strangulation) mechanisms affect the quenching of dwarfs. Because of the combination of these mechanisms, periodicity in the star formation history of the dwarf galaxies is expected. To check for their periodicity, Fourier transform was performed on the star formation history. By comparing the physical timescales and the periodicity, we determine the dominant effect working on the dwarfs. Then, we compare the dominant effects working on the galaxies according to their varying properties.

[포 GC-05] Pure Density Evolution of the Ultraviolet Quasar Luminosity Function at 2 < z < 6

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Quasar luminosity function (QLF) shows the active galactic nucleus (AGN) demography as a result of the combination of the growth and the evolution of black holes, galaxies, and dark matter halos along the cosmic time. The recent wide and deep surveys have improved the census of high-redshift quasars, making it possible to construct reliable ultraviolet (UV) QLFs at $2 < z < 6$ down to M1450 = -23 mag. By parameterizing these up-to-date observed UV QLFs that are the most extensive in both luminosity and survey area coverage at a given redshift, we show that the UV QLF has a universal shape, and their evolution can be approximated by a pure density evolution (PDE). In order to explain the observed QLF, we construct a model QLF employing the halo mass function, a number of empirical scaling relations, and the Eddington ratio distribution. We also include the outshining of AGN over its host galaxy, which made it possible to reproduce a moderately flat shape of the faint end of the observed QLF (slope of ~ -1.1). This model successfully explains the observed PDE behavior of UV QLF at $z > 2$, meaning that the QLF evolution at high redshift can be understood under the framework of halo mass function evolution. The importance of the outshining effect in our model also implies that there could be a hidden population of faint AGNs (M1450 > -24 mag), which are buried under their host galaxy light.

[포 GC-06] GECKO Optical Follow-up Observation of Three Binary Black Hole Merger Events

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We present optical follow-up observation results of three binary black hole merger (BBH) events, GW190408 181802, GW190412, and GW190503 185404, which were detected by the Advanced Ligo and Virgo gravitational wave (GW) detectors. Electromagnetic (EM) counterparts are generally not expected for BBH merger events, however, some theoretical models suggest that EM counterparts of BBH can possibly arise in special environments. To identify EM counterparts of the three BBH merger events, we observed high-credibility regions of the sky with telescopes of the Gravitational-wave EM Counterpart Korean

Observatory (GECKO), including the Korea Microlensing Telescope Network (KMTNet). Our observation started as soon as 100 minutes after the GW event alert and covered roughly 29 - 63 deg2 for each event with a depth of 22.5 mag in R-band within hours of observation. No plausible EM counterparts were found for these events. Our result gives a great promise for the GECKO facilities to find EM counterparts within few hours from GW detection in future GW observation runs.

[포 GC-07] Measuring sub-mm emission from local AGN host galaxies by JCMT SCUBA-2

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Observing sub-mm continuum emission from cold dust can play an important role in measuring star formation rates of galaxies, especially in the case of AGN host ones, since AGNs contaminate FIR fluxes by dust heating. To measure star formation rates, we observed total 49 local AGN host galaxies(z<0.2) by SCUBA-2 camera at James Clerk Maxwell Telescope(JCMT) at 450μm and 850μm. We performed several tests with the observed images to determine whether each source is detected, and adopted 3σ as the flux upper limit in non-detection cases. Using these measurements and FIR archival data, we modeled spectral energy distributions of the galaxies to estimate star formation rates. The effect of AGN activity on host galaxy star formation will be discussed.

[포 GC-08] KS4 Galaxy Clusters Catalog in Southern Sky

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Galaxy clusters are the largest structures in the universe located at the top of the cosmological hierarchical model, so the evolution of the universe can be understood by studying clusters of galaxies. Therefore, finding a larger number of galaxy clusters plays an important role in exploring how the universe evolves. A large number of catalogs for galaxy clusters in the northern sky have been published; however, there are few catalogs in the southern sky due to the lack of wide sky survey data. KMTNet Synoptic Survey of Southern Sky(KS4) project, which observes a wide area of the southern sky about 7000 deg^2 with KMTNet telescopes for two years, is in progress under the SNU Astronomy Research Center. We use the KS4 multi-wavelength optical data and measure photometric redshifts of galaxies for finding galaxy clusters at redshift z<1. Currently, the KS4 project has observed approximately 33% of the target region, and a pipeline that measures photometric redshifts of galaxies has been created. When the project is completed, we expect to find more than a hundred thousand galaxy clusters, and this will improve the study of galaxy clusters in the southern sky.

[포 GC-09] Globular Clusters in the NGC 4839 Group Merging with Coma: What Do They Tell about the Group History?

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The Coma cluster serves as an ideal laboratory to study the cluster assembly history. It is known as a typical example of relaxed galaxy clusters. However, recent X-ray, radio and optical observations revealed a number of substructures in Coma. The NGC 4839 group is an interesting substucture in the sense that it is overlappled with the X-ray bright component in the south-west region. Recent hydrodynamical simulations in the literature suggest that the NGC 4839 group came from the north-east direction of Coma, passed the apocenter about 1 Gyr ago, and started a second infall to the Coma core recently. Interestingly a number of E+A galaxies are located along the filament connecting the NGC 4839 group and the Coma core.

We are surveying a wide area covering the NGC 4839 group to search for globular clusters and use them to investigate any connection between the globular clusters and the merger scenario of the NGC 4839 group. We utilized Subaru Hyper Suprime-Cam archival images of two circular fields with diameter ~1.8 deg, covering the Coma core and the NGC 4839 group. We discuss the results with regard to the formation history of the NGC 4839 group.

[포 GC-10] The first five-year results of Seoul National University AGN Monitoring Project

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