and in the absence of bars, galaxy interactions/ mergers become important. In other words, in the presence of a massive central engine, the role of the two gas inflow mechanisms is reduced or almost disappears. We also find that bars in massive galaxies are very decisive in increasing AGN fractions when the host galaxies are inside clusters.

[구 GC-14] Magnetic Field Strengths of Flaring Region in the Jet of CTA 102

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We present the magnetic field strengths of CTA 102 using multi-frequency data at 2.6-343.5 GHz in order to study the physical origins of radio flares. The observations at 22 and 43 GHz were conducted using the single-dish radio telescopes of the Korean VLBI Network (KVN) from December 2012 until May 2018 (MJD 56200-58400). We used multi-frequency data obtained from the Effelsberg 100-m, OVRO 40-m, Metsähovi 14-m, IRAM 30-m, SMA, ALMA, and VLBA telescopes. During the period of the observations, two major flares (R1 and R2) are seen clearly at 15 and 37 GHz during MJD 57500-57800 and MJD 58000-58300, respectively. The source shows typical variability with time-scales ranging from 20-161 days at 15 GHz. The variability Doppler factor is in the range of 11.51-31.23. The quasi-simultaneous radio data are used to investigate the synchrotron spectrum of the source, finding that the synchrotron radiation is self-absorbed. The turnover frequency and the peak flux density of the synchrotron self-absorption (SSA) spectra are in ranges of 38.06-167.86 GHz and 1.49-10.38 Jy, respectively. From the SSA spectra, magnetic field strengths are estimated to be < 10 mG. The equipartition magnetic field strengths are larger than the SSA magnetic field strengths by a factor of > 100. This indicates that the radio flares may be related to a particle energy-dominated emission region.

[구 GC-15] Tales of AGN tails: How AGN tails become radio relics in merging galaxy clusters?

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Radio relics, Mpc-size elongated diffuse radio emissions found at galaxy cluster outskirts, are known as the result of shock acceleration during the cluster merger. Theories have claimed that low Mach number shocks are too inefficient to create the observed properties of radio relics. Alternative scenarios such as fossil cosmic ray electrons (CRes) from AGNs are required to explain the observations. However, how exactly the fossil CRes from AGNs can supply the Mpc-size radio relic is still an open question. In this study, we present our recent uGMRT radio observation results of the merging galaxy cluster Abell 514. We found three remarkable AGN jet tails that may have undergone multiple reorientations and extend nearly 800 kpc. Using multi-frequency data, we have performed spectral analysis along the AGN tails and track how the tails lose or gain energy as they propagate in the intracluster medium. We will discuss whether these AGN jets can provide sufficient seed CRes to radio relics.

[구 GC-16] Kennicutt-Schmidt law with H I velocity profile decomposition in NGC 6822

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[9]Kapteyn Astronomical Institute, University of Groningen, Groningen, The Netherlandsin English (optionally title in Korean in parentheses)

We present H I gas kinematics and star formation activities of NGC 6822, a dwarf galaxy located in the Local Volume at a distance of ~ 490 kpc. We perform profile decomposition of the line-of-sight velocity profiles of the high-resolution (42.4" × 12" spatial; 1.6 km/s spectral) H I data cube taken with the Australia Telescope Compact Array (ATCA). For this, we use a new tool, the so-called BAYGAUD (BAYesian GAUssian Decompositor) which is based on Bayesian Markov Chain Monte Carlo (MCMC) techniques, allowing us to decompose a line-of-sight velocity profile into

an optimal number of Gaussian components in a quantitative manner. We classify the decomposed H I gas components of NGC 6822 into bulk-narrow, bulk-broad, and non_bulk with respect to their velocity and velocity dispersion. We correlate their gas surface densities with the surface star formation rates derived using both GALEX far-ultraviolet and WISE 22 micron data to examine the impact of gas turbulence caused by stellar feedback on the Kennicutt-Schmidt (K-S) law. The bulk-narrow component that resides within r25 is likely to follow the linear extension of the Kennicutt-Schmidt (K-S) law for molecular hydrogen (H2) at the low gas surface density regime where H I is not saturated.

[구 GC-17] Galaxy Group Assembly Histories and the Missing Satellites Problem: A Case for the NGC 4437 Group

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The overprediction of the number of satellite galaxies in the LCDM paradigm compared to that of the Milky Way (MW) and M31 (the "missing satellites" problem) has been a long-standing issue. Recently, a large host-to-host scatter of satellite populations has been recognized both from an observational perspective with a larger sample and from a theoretical perspective including baryons, and it is crucial to collect diverse and complete samples with a large survey coverage to investigate underlying factors contributing to the diversity. In this study, we discuss the diversity in terms of galaxy assembly history, using satellite populations of both observed systems and simulated systems from IllustrisTNG. In addition to previously studied satellite systems, we identify satellite candidates from 25deg2 of Hyper Suprime-Cam Subaru Strategic Program (HSC-SSP) Wide layer around NGC 4437, a spiral galaxy of about one-fourth of the MW mass, paired with a ~2 magnitude fainter dwarf spiral galaxy NGC 4592. Using the surface brightness fluctuations (SBF) method, we confirm five dwarf galaxies as members of the NGC 4437 group, resulting in a total of seven members. The group consists of two distinct subgroups, the NGC 4437 subgroup and the NGC 4592 subgroup, which resembles the relationship between the MW and M31. The number of satellites is larger than that of other observed and simulated galaxy groups in the same host stellar mass range. However, the discrepancy decreases if compared with galaxy groups with similar magnitude gaps (V12 ~ 2), defined as the V-band magnitude difference between the two brightest galaxies in the group. Using simulated galaxy groups in IllustrisTNG, we find that groups with smaller V12 have richer satellite systems, host more massive dark matter halos, and have assembled more recently. These results show that the host-to-host scatter of satellite populations can be attributed to the diversity in galaxy assembly history and be probed by V12 to some degree and that NGC 4437 group is likely a recently assembled galaxy group with a large halo mass compared to galaxy groups of similar luminosity.

[구 GC-18] Searching for MgII absorbers in and around galaxy clusters

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To study environmental effects on the circumgalactic medium (CGM), we use the samples of redMaPPer galaxy clusters, background quasars and cluster galaxies from the SDSS. With 82,000 quasar spectra, we detect 197 MgII absorbers in and around the clusters. The detection rate per quasar is 2.70 times higher inside the clusters than outside the clusters, indicating that MgII absorbers are relatively abundant in clusters. However, when considering the galaxy number density, the absorber-to-galaxy ratio is rather low inside the clusters. If we assume that MgII absorbers are mainly contributed by the CGM of massive star-forming galaxies, a typical halo size of cluster galaxies is smaller than that of field galaxies by 30 per cent. This finding supports that galaxy haloes can be truncated by interaction with the host cluster.

[구 GC-19] Catching a growing giant: Discovery of a galaxy cluster in formation

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In LCDM universe, large, massive structures, like galaxy clusters, grow through the successive accretion/mergers of smaller structures. Therefore, at high redshift, unlike local, it is expected that there would be plenty of galaxy clusters which are still growing. Here, we report the discovery of a high-redshift (z~1) galaxy cluster which is in its active formation stage. This cluster is well connected to the large scale overdense environment and contains high fraction of star-forming galaxies, providing a good example supporting our previously suggested 'Web-feedin