

선속도 차이는 (308.8km/s)상승하였다. 이를 통해 성간 물질의 물리량 차이만으로는 400km/s 이상의 큰 선속도 차이를 만드는 것은 어렵다. 관측에서 보이는 400km/s 이상의 몇몇 큰 선속도 차이의 은하를 위해서는 이 시뮬레이션에 포함되지 않은 성운 주위의 물질과 같은 부분이나, 은하 합병과 같은 극한의 상황이 필요할 것이다.

[포 GC-13] ALMA/ACA CO (1-0) observations of group galaxies

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Galaxy groups are the place where many galaxies feel the impact of the surroundings (e.g., merging, tidal interaction, ram pressure stripping) before joining bigger structures like (sub)clusters. A significant fraction of galaxies is quenched in the group environment. Such “pre-processing” of galaxies in groups is likely to affect galaxy evolution tremendously. To better understand how environmental processes in galaxy groups affect molecular gas, star formation activity, and galaxy evolution, we carried out CO imaging observations of group galaxies, using the Atacama Compact Array (ALMA/ACA). We selected all the targets that have been detected in the GEMS-HI survey for two groups, making the sample of 40 galaxies (18 galaxies in IC 1459 group and 22 galaxies in NGC 4636 group). Our ALMA/ACA observation is the first CO imaging survey for two groups. In this work, we present CO images of group galaxies, together with their star formation maps and HI images. Our ACA CO data show the asymmetric distribution of molecular gas in some of our samples. We discuss the impact of the group environment on molecular gas and star formation activity

[포 GC-14] Properties of Galaxies in Cosmic Filaments around the Virgo Cluster

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We present the properties of galaxies in filaments around the Virgo cluster with respect to their vertical distance from the filament spine. Using the NASA–Sloan Atlas and group catalogs, we select galaxies that do not belong to groups in filaments. The filament member galaxies are then defined as those located within 3.5 scale length from the filament spine. The filaments are mainly (~86%) composed of low-mass dwarf galaxies of $\log h^2 M_*/M_\odot < 9$ dominantly located on the blue cloud in color–magnitude diagrams. We observe that the $g-r$ color and stellar mass of galaxies correlate with their vertical distance from the filament spine in which the color becomes red and stellar mass decreases with increasing vertical filament distance. The galaxies were divided into two subsamples in different stellar mass ranges, with lower-mass ($\log h^2 M_*/M_\odot \leq 8$) galaxies showing a clear negative $g-r$ color gradient, whereas higher-mass ($\log h^2 M_*/M_\odot > 8$) galaxies have a flat distribution against the vertical filament distance. We observe a negative EW(H α) gradient for higher-mass galaxies, whereas lower-mass galaxies show no distinct variation in EW(H α) against the vertical filament distance. In contrast, the $NUV-r$ color distribution of higher-mass galaxies shows no strong dependence on the vertical filament distance, whereas the lower-mass galaxies show a distinct negative $NUV-r$ color gradient. We do not witness clear gradients of HI fraction in either the higher- or lower-mass subsamples. We propose that the negative color and stellar mass gradients of galaxies can be explained by mass assembly from past galaxy mergers at different vertical filament distances. In addition, galaxy interactions might be responsible for the contrasting features of EW(H α) and $NUV-r$ color distributions between the higher- and lower-mass subsamples. The HI fraction distributions of the two subsamples suggest that ram-pressure stripping and gas accretion could be ignorable processes in the Virgo filaments.

[포 GC-15] Phas-space Analysis of Halos around Large-scale Filamentary Structures

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It has been studied that galaxies evolve following a typical trajectory on the phase space under the influence of deep gravitational potential of galaxy clusters. Similarly, the large-scale filaments could also affect the evolution of galaxies before falling into the clusters. In this study, using a dark

matter-only cosmological simulation, N-Cluster Run, we explore the evolution of galaxies on the phase space driven by large-scale filaments. We find that galaxies around the filaments form a common trajectory on the phase space as well as cluster galaxies do. We also examine how these trajectories change depending on various physical parameters such as galaxy mass, initial distance of galaxies from large-scale filaments, and cluster mass.

[포 GC-16] Deep polarization observations of a ram pressure stripped galaxy, NGC 4522

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We present high-resolution, high-sensitivity continuum data of NGC 4522 observed at 3 cm (X-band) and 10 cm (S-band) in full polarization mode using the JVLA. This observation has 2 - 4 times better spatial resolution and 2 - 5 times better sensitivity compared to previous continuum observations. NGC 4522 is a Virgo spiral galaxy undergoing active ram pressure stripping. This galaxy is particularly well known for the CO emission detected outside its stellar disk, some of which coincides with the extraplanar HI gas and H α patches. The major goal of our JVLA observation is to leverage our understanding of the influence of the ram pressure on the general ISM field and multi-phase medium. By combining our new deep radio continuum data and previous observations, we will investigate how the B-field properties can be affected by the ram pressure, and what roles the B-field plays in the stripping process of the multi-phased ISM and in the star formation activity when the ram pressure is present.

[포 GC-17] Physical Connection between Ionized Outflows and Radio jets in Young Radio Quasars.

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We present NIR spectroscopic data of young radio quasars obtained from Flamingos-2 (F2) at Gemini-South. The targets are originally selected

from Wide-Field Infrared Survey Explorer survey in combination with radio survey data, such as FIRST and NVSS. Our goal is to find observational evidence of jet-driven outflows, which is expected to be present in young luminous quasars from the theoretical studies. While 16 targets were observed with F2, narrow emission lines ([O III] or H α) were detected in 7 targets. FWHM of the emission lines (up to 2500 km/s) were remarkably broad compared to ordinary quasars, revealing the presence of strong outflows. The black hole mass estimated from Eddington limit ranges from ~ 108 to 109 solar mass, indicating that the target quasars are likely to be progenitors of massive galaxies. Finally, we present the comparisons between the outflow velocity and the physical properties of radio jets derived from the VLA radio imaging data, in order to investigate the physical connection between the ionized outflows and radio jets.

[포 GC-18] Evolution of Star Formation Rate - Density Relation over Cosmic Time in a Simulated Universe: the Observed Reversal Reproduced

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We use the IllustrisTNG cosmological hydrodynamical simulation to study the evolution of star formation rate (SFR)-density relation over cosmic time. We construct several samples of galaxies at different redshifts from $z=2.0$ to $z=0.0$, which have the same comoving number density. The SFR of galaxies decreases with local density at $z=0.0$, but its dependence on local density becomes weaker with redshift. At $z \geq 1.0$, the SFR of galaxies increases with local density (reversal of the SFR-density relation), and its dependence becomes stronger with redshift. This change of SFR-density relation with redshift still remains even when fixing the stellar masses of galaxies. The dependence of SFR on the distance to a galaxy cluster also shows a change with redshift in a way similar to the case based on local density, but the reversal happens at a higher redshift, $z \sim 1.5$, in clusters. On the other hand, the molecular gas fraction always decreases with local density regardless of redshift at $z=0.0-2.0$ even though the dependence becomes weaker when we fix the stellar mass. Our study demonstrates that the observed reversal of the SFR-density relation at $z \geq 1.0$ can be successfully reproduced in cosmological simulations. Our results are consistent with the idea that massive, star-forming galaxies are strongly clustered at high redshifts, forming larger structures. These