[구GC-07] Local Hα Emitters: Low-z Analogs of z>4 Star-Forming Galaxies

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We have identified local analogs of strong Hα Emitters (HAEs) that dominate the z∼4 Lyman-break galaxy population using the Sloan Digital Sky Survey (SDSS). At z<0.4, only 0.04% of galaxies are classified as HAEs with Hα equivalent width larger than 500 Å, comparable to that of z∼4 HAEs. The Hα-to-UV luminosity ratio of local HAEs is consistent with that of z∼4 HAEs, indicating relatively large specific star formation rate in these galaxies compared to traditionally studied UV-selected Lyman break analogs. Local HAEs are young, less evolved galaxies with low metallicity. It is still difficult to constrain whether the star formation in local HAEs is powered by minor mergers or by cosmological cold gas accretion. However, the stacked optical spectrum of local HAEs shows several strong ionization lines, for example HeII 4686 emission line, which are shown in Wolf-Rayet galaxies. Thus it is highly likely that local HAEs are galaxies with an elevated ionization parameter, either due to a high electron density or large escape fraction of hydrogen ionizing photons.

[구GC-08] Searching for Fly-by Encounters of Galaxies in Cosmological Simulations

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Fly-by interactions of galaxies are hidden drivers of galaxy evolution: The impulsive encounters are by far more frequent than and thus as important as direct mergers, yet hard to identify observationally. Here we present the key characteristics of fly-bys that are examined theoretically via cosmological N-body simulations. In particular, we use the simulations generated by a particle-mesh tree code, GOTPM, and investigate the statistics of galactic fly-by interactions, which are defined by the total energy of two halos of interest being positive and their minimum distances escaping mergers. We discuss (1) the rate of fly-by interactions (the Fly-by Rate, R_f) as functions of(a) redshifts, (b) halo masses and mass ratios, and (c) environments, and (2) their impact on galaxy evolution in terms of morphology and star-formation rate, in comparison to that of direct mergers.