[구GC-03] The Fundamental Planes of "E+A" Galaxies and GALEX UV-excess Early-typeGalaxies: Revealing their Evolutionary Connection

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Recent GALEX observations reveal enhanced UV fluxes from an unexpectedly large fraction of early-type galaxies in the local universe ($z < 0.2$). The UV-excess early-types are believed to represent galaxies with recent star formation (RSF) activities. Here, the UV data enable us to identify at least three otherwise unrecognizable sub-classes of early-type galaxies. Based on their RSF characteristics derived from both GALEX UV and SDSS Ha emission data, the early-types are broken into galaxies (a) in a quiescent mode (QST: no UV, no Ha), (b) in a post-SF mode (RSF: UV, no Ha), and (3) in an ongoing starburst mode (SHa: UV, strong Ha). Comparing to the Fundamental Plane defined by SDSS DR6 1,284 "E+A"galaxies, we have discovered an interesting evolutionary path from "E+A" via RSF to QST. The UV-selected RSFgalaxies thus represent the milder cousins (if RSF was weak) or the living relics (if RSF was quenched quite a while ago) of "E+A" galaxies, and will turn into QST's with time. Given that UV-excess galaxies (i.e., RSF) are not in general distinguishable from UV-dead (i.e., QST) ones by their red optical colors, the GALEX is watching the latest new-comers reaching the red sequence.

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[구GC-04] Global Star Formation Rate Density over 0.7<z<1.9

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We investigate the global star formation rate density at $0.7<z<1.9$ using emission-line selected galaxies identified in Hubble Space Telescope Near Infrared Camera and Multi-Object Spectrograph (HST-NICMOS) grism spectroscopy observations. Over the ~104 arcmin^2 of the parallel survey during Cycle 12 and 13, we select 80 galaxies with possible redshifted Hα emission lines. The Hα luminosity range of the emission-line galaxy sample is $4.4\times10^{41} < L(H\alpha) < 1.5\times10^{43}$ erg/s for given cosmology. In this luminosity range, the luminosity function is well-fitted by a Schechter function with $\phi^* = 3.0\times10^{-3}$ Mpc^{-3}, $L^* = 3.4\times10^{42}$ erg/s, and $\alpha=-1.41$. We derive the volume-averaged star formation rate density of 0.118 $M_\odot$/yr/Mpc^3 at $z=1.4$ without an extinction correction. In addition to the star formation rate density over the entire redshift range, we also derive star formation rate density of 0.094 $M_\odot$/yr/Mpc^3 at $z=1.1$, 0.160 $M_\odot$/yr/Mpc^3 at $z=1.6$. The overall star formation rate density is consistent with previous studies using H-alpha when the average extinction correction is applied. Specifically, we see the increase of star formation rate density between $z=1.1$ to $z=1.6$ within the homogeneous sample.