

[7GC-05] The effect of young stellar populations in Early-type galaxies

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We have investigated the radial $g-r$ color gradients of early-type galaxies in the Sloan Digital Sky Survey (SDSS) DR6 in the redshift range $0.00 < z < 0.06$. The majority of massive early-type galaxies show a negative color gradient (red-cored) as generally expected for early-type galaxies. On the other hand, roughly 30% of the galaxies in this sample show a positive color gradient (blue-cored). These “blue-cored” galaxies often show strong $H\beta$ absorption-line strengths and/or emission-line ratios that are indicative of the presence of young stellar populations. This implies that most of the residual star formation in early-type galaxies is centrally concentrated. Blue-cored galaxies are predominantly low-velocity dispersion systems. A simple model shows that the observed positive color gradients are visible only for a billion years after a star formation episode for the typical strength of recent star formation. The observed effective radius decreases and the mean surface brightness increases due to this centrally concentrated star formation episode. As a result, the majority of blue-cored galaxies may lie on different regions in the fundamental plane (FP) from red-cored ellipticals. However, the position of the blue-cored galaxies on the FP cannot be solely attributed to recent star formation but requires substantially lower velocity dispersion. We conclude that a low-level of residual star formation persists at the centers of most of low-mass early-type galaxies, whereas massive ones are mostly quiescent systems with metallicity-driven red cores.

[7GC-06] AKARI Observation of the North Ecliptic Pole (NEP) Supercluster at $z=0.087$

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We present a multi-wavelength study of a supercluster in the NEP region at $z = 0.087$, using AKARI (Infrared space telescope) NEP-Wide (5.8 deg²) survey which has obtained an unique IR imaging dataset with contiguous wavelength coverage from 2 to 24 μ m, overcoming the Spitzer limitation of imaging capability at 10–20 μ m. The NEP-Wide survey is also covered in other wavelength such as X-ray, Radio, GALEX UV in the archive, optical (BRI from Maidanak 1.5m and CFHT’s MegaPrime), and NIR imaging data (JH from KPNO 2.1m), with nearly 1900 optical spectra, mostly obtained by our group using MMT/Hectospec and WIYN/Hydra.

Armed with the multiwavelength datasets, we investigate the connection between IR properties of galaxies and their environments as a tool to understand the evolution of galaxies in a supercluster environment. Specific attention will be given to MIR emission which can trace star formation activities and passive phases right after post-starbursts, and its relation to other wavelength data.

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