galaxies in the Sloan Digital Sky Survey (SDSS) DR6 in the redshift range 0.00 < z < 0.06. The color profiles of ~30 per cent of the galaxies in this sample show positive color gradients (centers being bluer). These positive gradient galaxies often show strong Hβ absorption line strengths or emission line ratios that are consistent with star-forming populations. Combining the optical data with Galaxy Evolution Explorer (GALEX) UV photometry, we find that all positive gradient galaxies show blue UV-optical colors. They also exhibit a tendency of having a lower stellar velocity dispersion. Positive gradient galaxies tend to live in lower density regions than negative gradient galaxies and are likely to have a late-type companion galaxy. On the other hand, massive early-type galaxies show negative color gradients. A simplistic population analysis shows that these positive color gradients are visible only for half a billion years after a star burst. Although the effective radius decreases and mean surface brightness increases due to this centrally concentrated star formation, the positions of the positive gradient galaxies on the fundamental plane cannot be reproduced by any amount of recent star formation. Instead it required a lower velocity dispersion.

[Ⅶ-1-3] Improved spectral line measurements of the SDSS galaxy spectra

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We have established a database of galaxy spectral line strengths for the SDSS database using an improved line measuring method. Our work includes the entire SDSS DR7 galaxies within redshift of 0.2. The absorption line strengths measured by the SDSS pipeline are seriously contaminated by emission filling. Our code, GANDALF (gas and absorption line fitting code) performs more accurate measurements by effectively separating emission lines from absorption lines. A significant improvement has also been made on the velocity dispersion measurement, more notably in late-type galaxies. We have also identified a number of broad line region galaxies which were misclassified as normal galaxies by the SDSS pipeline. We developed an effective method measuring their line strengths. The database will be provided with new parameters that are indicative of the line strength measurement quality. In addition, we made galaxy templates for the Hubble sequence. The database will be useful for many fields of galaxy studies including star formation and AGN activities.

[Ⅶ-1-4] Tidal Dwarf Galaxies around a Post-Merger Galaxy, NGC 4922

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One possible channel for the formation of dwarf galaxies involves birth in the tidal tails of interacting galaxies. We report the detection of a bright UV tidal tail and several young tidal dwarf galaxy candidates in the post-merger galaxy NGC 4922 in the Coma cluster. Based on a two-component population model (combining young and old stellar populations), we find that its light predominantly comes from young stars (a few Myr old). The Galaxy Evolution Explorer (GALEX) ultraviolet data played a critical role in the parameter (age and mass) estimation. Our stellar mass estimates of the tidal dwarf galaxy candidates are ~10^{6-7} M_sun, typical for dwarf galaxies.

[Ⅶ-1-5] The Asymptotic Giant Branch Stars in Nearby Dwarf Galaxies, NGC 6822, IC 1613, and NGC 205

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To investigate properties of the stellar contents of the resolved asymptotic giant branch stars in the nearby dwarf galaxies, we obtained wide-field JHKs images of the dwarf irregular galaxies NGC 6822, IC 1613 and the dwarf elliptical galaxy NGC 205, using the WIRCam near-infrared imager of the CFHT. The obtained (J-Ks, Ks) and (H-Ks, Ks) color-magnitude diagrams for the resolved stars in the galaxies contain populations of foreground stars, super giant stars, red giant stars and the asymptotic giant branch (AGB) stars. Using corollary photometric data in the visible bands, AGB stars were selected in the color-magnitude diagrams with a wide wavelength baseline in color indices. In color-color diagrams of the resolved AGB stars, we identified C stars from M giant stars for each galaxies, i.e., 726 C stars in NGC 6822, 126 C stars in IC 1613 and 593 C stars in NGC 205. The number ratios of C stars to M-giants were estimated to be 0.59±0.03 in NGC 6822,