[구GC-25] Merging Features and Optical-NIR Color Gradient of Early-type Galaxies

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It has been suggested that merging plays an important role in the formation and the evolution of early-type galaxies (ETGs). Optical-NIR color gradients of ETGs in high density environments are found to be less steep than those of ETGs in low density environments, hinting frequent merger activities in ETGs in high density environments. In order to examine if the flat color gradients are the result of dry mergers, we studied the relations between merging features, color gradient, and environments of 281 low redshift ETGs selected from Sloan Digital Sky Survey (SDSS) Stripe82. The sample contains 222 relaxed ETGs, 38 ETGs with tidal features, 10 galaxies with dust features and 11 galaxies with tidal and dust features, and Near Infrared (NIR) images are taken from UKIRT Infrared Deep Sky Survey (UKIDSS) Large Area Survey (LAS). We find that r-K color gradients of field sample galaxies are steeper than those of sample ETGs within cluster environments. For the field sample galaxies, a relatively large number of galaxies with peculiar features contribute to the steeper color gradients, while the absence of these peculiar early-type galaxies make color gradients of the cluster sample galaxies intact. In high density environment, ETGs are already evolved and relaxed, resulting flat color gradients. However, in low density environments, a majority of ETGs undergone merging recently which makes the color gradients steep.

[구GC-26] Early-type host galaxies of Type II and Ib supernovae

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Recent studies find that some early-type galaxies host Type II or Ibc supernovae (SNe II, Ibc). This may imply recent star formation activities in these SNe host galaxies, but a massive star origin of the SNe Ib so far observed in early-type galaxies has been questioned because of their intrinsic faintness and unusually strong Ca lines shown in the nebular phase. To address the issue, we investigate the properties of early-type SNe host galaxies using the data with Galaxy Evolution Explorer (GALEX) ultraviolet photometry and the Sloan Digital Sky Survey optical data. Our sample includes eight SNe II and one peculiar SN Ib (SN 2000ds) host galaxies as well as 32 SN Ia host galaxies. The host galaxy of SN 2005cz, another peculiar SN Ib, is also analyzed using the GALEX data and the NASA/IPAC Extragalactic Database optical data. We find that the NUV - optical colors of SN II/Ib host galaxies are systematically bluer than those of SN Ia host galaxies, and some SN II/Ib host galaxies with NUV − r colors markedly bluer than the others exhibit strong radio emission. We perform a stellar population synthesis analysis and find a clear signature of recent star formation activities in most of the SN II/Ib host galaxies. Our results generally support the association of the SNe II/Ib hosted in early-type galaxies with core collapse of massive stars. We briefly discuss implications for the progenitors of the peculiar SNe Ib 2000ds and 2005cz.