[포GC-22] TRGB Distances to Type Ia Supernova Host Galaxies in the Leo I Group and the Hubble Constant

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Type Ia supernovae (SNe Ia) are a powerful tool to investigate the expansion history of the universe, because their peak luminosity is as bright as a galaxy and is known as an excellent standard candle. Since the discovery of the acceleration of the universe based on the observations of SNe Ia, higher than ever accuracy of their peak luminosity is needed to investigate various problems in cosmology. We started a project to improve the accuracy of the calibration of the peak luminosity of SNe Ia by measuring accurate distances to nearby resolved galaxies that host SNe Ia. We derive

accurate distances to the SN Ia host galaxies using the method to measure the luminosity of the tip of the red giant branch (TRGB). In this study we present the results for M66 and M96 in the Leo I Group which are nearby spiral galaxies hosting SN 1989B and SN 1998bu, respectively. We obtain VI photometry of resolved stars in these galaxies from F555W and F814W images in the Hubble Space Telescope archive. We derive the distances to these galaxies from the luminosity of the TRGB. With these results we derive absolute maximum magnitudes of two SNe (SN 1989B in M66 and SN 1998bu in M96). We derive a value of the Hubble constant from the optical magnitudes of these SNe Ia and SN 2011fe in M101 based on our TRGB analysis. This value is similar to the values derived from recent estimates from WMAP9 and Planck results, but smaller than other recent determinations based on Cepheid calibration for SNe Ia luminosity.

[포GC-23] Recent Star Formation History of M31 and M33

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We studied recent evolution of M31 and M33 with star-forming regions and hot massive stars. We use GALEX far-UV and near-UV imaging to detect the star-forming regions and trace the recent star formation across the entire disk of galaxies. The GALEX imaging, combining deep sensitivity and entire coverage of these galaxies, provides a complete picture of the recent star formation in M31 and M33, and its variation with environment throughout these galaxies. We also show results from recent extensive surveys in M31 and M33 with Hubble Space Telescope multi-wavelength data including UV filters, which imaged several regions at a linear resolution of less than half a pc in these galaxies. Both datasets allow us to study the hierarchical structure of star formation: the youngest stellar groups are the most compact, and are often arranged withing broader, sparser structures. The derived recent star-formation rates are rather similar for the two galaxies, when scaled for the respective areas.