KASI

Carnegie Hubble Program II (hereafter CHP II) is a large Hubble Space Telescope (HST) observing campaign in the cycle 22 composed of a total of 184 orbits (132 primes + 52 parallels), which aims to measure H0 directly with an unprecedented accuracy. Unlike our previous efforts in CHP I which used Cepheids as a yardstick, CHP II takes the Population II (Pop II) distance indicators such as RR Lyraes and tip of the red giant branch stars (TRGBs) to set up a new calibration to Type Ia supernovae (SN Ia) distance. The Pop II distance scales have two immediate advantages over the classical Cepheid method: 1) The period-luminosity relation of the RR Lyrae has a scatter that is a factor of 2 smaller; 2) The RR Lyrae/TRGB distance scale can be applied to both elliptical and spiral galaxies. This will provide a great systematic benefit by ultimately allowing us to double the number of SN Ia distances based on geometry. By taking advantage of this Pop II route, we expect to measure H0 value to 3 % of error which will be the highest accuracy H0 measurement to date using the "Distance Ladder" method. In this talk I will present a brief background/overview on the CHP II, observations/data acquisition status, and ongoing research progress/preliminary results.

[구 GC-18] How Much Do We Understand the Properties of Supernova Remnants in M81 and M82?

Jubee Sohn[1], Myung Gyoon Lee[1], Jong Hwan Lee[1,2], Sungsoon Lim[3,4], In Sung Jang[1], Youkyung Ko[1], Bon-Chul Koo[1], Narae Hwang[5], Sang Chul Kim[5,6], Byeong-Gon Park[5,6]
[1]*Department of Physics and Astronomy, Seoul National University,*
[2]*Aerospace Research Center, Korea Air Force Academy,*
[3]*Department of Astronomy, Peking University,*
[4]*Kavli Institute for Astronomy and Astrophysics, Peking University,*
[5]*Korea Astronomy and Space Science Institute*
[6]*Korea University of Science and Technology*

We present an optical spectroscopic study of 28 supernova remnant (SNR) candidates in M81 and two SNR candidates in M82. The optical spectra of these SNR candidates were obtained using the MMT/Hectospec as a part of the K-GMT Science Program. Based on the [S II]/Hα ratio and the radial velocity, we find that twenty six out of the M81 candidates are genuine SNRs. Two SNR candidates in M82 are thought to be shocked condensations in the galactic outflow or SNRs. In the spectral line ratio diagrams, M81 SNRs are divided into two groups: an [O III]-strong group and an [O III]-weak group. The [O III]-weak SNRs have larger sizes, and may have faster shock velocity. We estimate the nitrogen and oxygen abundance of the SNRs from the comparison with shock-ionization models. We find a radial gradient in nitrogen abundance, dLog(N/H)/dlogR = -0.023 ± 0.009 dex kpc^{-1}, and little evidence for the gradient in oxygen abundance. The nitrogen abundance shows shallower gradient than those of the planetary nebulae and H II regions of M81. We find five X-ray emitting SNRs. Their X-ray hardness colors are consistent with thermal SNRs.

[구 GC-19] Environmental Dependence of Star-formation Properties of Galaxies at 0.5 < z < 2

Seong-Kook Lee, Myungshin Im, Jae-woo Kim
Center for the Exploration of the Origin of the Universe, Department of Physics and Astronomy, Seoul National University

At local, galaxy properties are well known to be clearly different in different environments. However, it is still an open question how this environment-dependent trend has been shaped. In this presentation, we will show the results of our investigation about the evolution of star-formation properties of galaxies over a wide redshift range, from z~ 2 to z~0.5, focusing its dependence on their stellar mass and environment. In the UKIDSS/UDS region, we estimated photometric redshifts and stellar population properties, such as stellar masses and star-formation rates, using the deep optical and near-infrared data available in this field. Then, we identified galaxy cluster candidates at z~0.5-2.

Through the analysis and comparison of star-formation (SF) properties of galaxies in clusters and in field, we found interesting results regarding the evolution of SF properties of galaxies: (1) regardless of redshifts, stellar mass is a key parameter controlling quenching of star formation in galaxies; (2) At $z<1$, environmental effects become important at quenching star formation regardless of stellar mass of galaxies; and (3) However, the result of the environmental quenching is prominent only for low mass galaxies ($M_* < 10^{10}\ M_\odot$) since the star formation in most of high mass galaxies are already quenched at $z > 1$.