[구GC-06] Optical and Near-IR Photometry of the NGC 4874 Globular Cluster System with the *Hubble Space Telescope*

Hyejeon Cho[1], John P. Blakeslee[2], Eric W. Peng[3,4], and Young-Wook Lee[1]
[1]*Department of Astronomy and Center for Galaxy Evolution Research, Yonsei University, Korea,* [2]*Herzberg Institute of Astrophysics, National Research Council of Canada (NRC-HIA), Canada,* [3]*Department of Astronomy, Peking University, China,* [4]*Kavli Institute for Astronomy and Astrophysics, Peking University, China*

We present our study of analyzing the photometric properties of the globular cluster (GC) system which resides in the extended halo of the central bright Coma cluster galaxy NGC 4874. The core of the Coma cluster of galaxies (Abell 1656) was observed with both the HST Advanced Camera for Surveys (ACS) in the F475W (g475) and F814W (I814) and Wide Field Camera 3 IR Channel (WFC3/IR) in the F160W (H160) filters. The data analysis procedure and GC candidate selection criteria are briefly described. We investigate the interesting "tilt" features in color-magnitude diagrams for this GC system and their link to the nonlinear color-metallicity relation for GCs. The NGC 4874's GC system exhibits a bimodal distribution in the optical g475-I814 color and much more than half the GCs fall in the red side at g475-I814 ~ 1.1. This bimodality is weakened in the optical-IR I814-H160 color; the quantitative analysis on the features of both color distributions using the Gaussian Mixture Modeling code proves the bimodalities are different. Both colors, thus, cannot linearly reflect the bimodality of an underlying metallicity, supporting the suggestion that observed bimodalities in extragalactic GC colors are the metallicity-to-color projection effect.

[구GC-07] Dual Halos and Formation of Bright Elliptical and Lenticular Galaxies

Myung Gyoon Lee[1], Hong Soo Park[1,2]
[1]*Dept of Physics and Astronomy, Seoul National University,*
[2]*Subaru Telescope, NAOJ*

Recently it turns out that simple-looking elliptical galaxies and lenticular galaxies are more complex and intriguing than expected. One of the most surprising and intriguing findings in extragalactic studies during the last two decades is a discovery that the color distribution of the globular clusters in these galaxies is bimodal, suggesting that there are two subpopulations: blue and red globular clusters. We present a determination of the two-dimensional shape parameters of the blue and red globular cluster systems (GCSs) in a large number of bright elliptical galaxies and lenticular galaxies. The position angles of both blue and red GCSs show a correlation with those of the stellar light distribution, showing that the major axes of the GCSs are well aligned with those of their host galaxies. However, the shapes of the red GCSs show a tight correlation with the stellar light distribution as well as with the rotation property of their host galaxies, while the shapes of the blue GCSs do much less. These provide clear geometric evidence that the origins of the blue and red globular clusters are distinct and that these galaxies may have dual halos: a blue (metal-poor) halo and a red (metal-rich) halo. These two halos show significant differences in metallicity, structure, and kinematics, indicating that they are formed in two distinguishable ways. The red halos might have formed via dissipational processes with rotation, while the blue halos are through accretion.