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Ultra-diffuse galaxies (UDGs) are an unusual galaxy population. They are ghostlike galaxies with fainter surface brightness than normal dwarf galaxies, but they are as large as MW-like galaxies. The key question on UDGs is whether they are 'failed' giant galaxies or 'extended' dwarf galaxies. To answer this question, we study UDGs in massive galaxy clusters. We find an amount of UDGs in deep HST images of three Hubble Frontier Fields clusters, Abell 2744 (z=0.308), Abell S1063 (z=0.347), and Abell 370 (z=0.374). These clusters are the farthest and most massive galaxy clusters in which UDGs have been discovered until now. The color-magnitude relations show that most UDGs have old stellar population with red colors, while a few of them show bluer colors implying the existence of young stars. The stellar masses of UDGs show that they have less massive stellar components than the bright red sequence galaxies. The radial number density profiles of UDGs exhibit a drop in the central region of clusters, suggesting some of them were disrupted by strong gravitational potential. Their spatial distributions are not homogeneous, which implies UDGs are not virialized enough in the clusters. With virial masses of UDGs estimated from the fundamental manifold, most UDGs have M_200 = 10^10 - 10^11 M_Sun indicating that they are dwarf galaxies. However, a few of UDGs more massive than 10^11 M_Sun indicate that they are close to failed giant galaxies.

[포 SA-05] The photometric and spectroscopic study of the near-contact binary XZ CMi

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It has been known that XZ CMi is a near-contact binary composed of a hotter and more massive main-sequence primary star close to its Roche-lobe and a Roche-lobe filling giant/subgiant secondary star. There still exist, however, many discordant matters among the previous investigators: diverse mass ratios and temperatures ranging from 0.38 to 0.83 and from 7,000 K to 8,876 K, respectively. In order to make a contribution to the two confusions we conducted spectroscopic and photometric observations. A total of 34 high-resolution spectra were obtained during 4 nights from 2010 and 2018 with the Bohyunsan Optical Echelle Spectrograph (BOES) at the Bohyunsan Optical Astronomy Observatory (BOAO). In parallel, BVRI multi-band photometric observations were carried out 5 nights in 2010 at Sobaeksan Optical Astronomy Observatory (SOAO). In this presentation, we present physical parameters of XZ CMi through the simultaneous analyses of new double-lined radial velocity curves and new light curves. We will also briefly discuss the evolutionary status of the system.