for MIR properties of galaxies in the Coma supercluster using multi-wavelength data from the optical to MIR including the Sloan Digital Sky Survey Data Release 12 and the *Wide-field Infrared Survey Explorer*. We investigate differences in MIR properties of galaxies among three galaxy systems, and discuss the results in relation with star formation history and morphological transformation of galaxies.

[포 GC-19] The Effective Cross-sections of a Lensing galaxy: Singular Isothermal Sphere with External Shear.

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We present our recent work published in the MNRAS (Lee and Kim, 2014). Numerical studies of the imaging and caustic properties of the singular isothermal sphere (SIS) under a wide range of external shear (from 0.0 to 2.0) are presented. Using a direct inverse mapping formula for this lensing system, we investigate various lensing properties for both low-shear (i.e. $\gamma<1.0$) and high-shear (i.e. $\gamma>1.0$) cases. We systematically analyse the effective lensing cross-sections of double-lensing and quadruple-lensing systems, based on the radio luminosity function obtained by the Jodrell-VLA Astrometric Survey (JVAS) and the Cosmic Lens All-Sky Survey (CLASS). We find that the limit of a survey selection bias (i.e. between brighter and fainter images) preferentially reduces the effective lensing cross-sections of two-image lensing systems. By considering the effects of survey selection bias, we demonstrate that the long-standing anomaly over the high quads-to-doubles ratios (i.e. 50~70 % for JVAS and CLASS) can be explained by the moderate effective shear of 0.16~0.18, which is half that of previous estimates. The derived inverse-mapping formula could make the SIS + shear lensing model useful for galaxy-lensing simulations.

[포 GC-20] The temperature and density distribution of molecular gas in a galaxy undergoing strong ram pressure: a case study of NGC 4402

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Galaxies are known to evolve passively in the cluster environment. Indeed, much evidence for HI stripping has been found in cluster galaxies to date, which is likely to be connected to their low star formation rate. What is still puzzling however, is that the molecular gas, which is believed to be more directly related to star formation, shows no significant difference in its fraction between the cluster population and the field galaxies. Therefore, HI stripping alone does not seem to be enough to fully understand how galaxies become passive in galaxy clusters. Intriguingly, our recent high resolution CO study of a subsample of Virgo spirals which are undergoing strong ICM pressure has revealed a highly disturbed molecular gas morphology and kinematics. The morphological and kinematical peculiarities in their CO data have many properties in common with those of HI gas in the sample, indicating that strong ICM pressure in fact can have impacts on dense gas deep inside of a galaxy. This implies that it is the molecular gas conditions rather than the molecular gas stripping which is more responsible for quenching of star formation in cluster galaxies. In this study, using multi transitions of 12CO and 13CO, we investigate the density and temperature distributions of CO gas of a Virgo spiral galaxy, NGC 4402 to probe the physical and chemical properties of molecular gas and their relations to star formation activities.

[포 GC-21] Environmental Dependence of Galactic conformity in the Virgo Cluster

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It is known that the galaxy evolution by direct interaction between galaxies is most active in a galaxy group. As a result, the satellite galaxies are closely related to their central galaxy in properties such as morphology, color and star formation rate (so-called 'galactic conformity'). However, it is not clear yet whether such conformity between galaxies is found in a galaxy cluster. Recently, Lee et al. (2014) have found a measurable correlation between the colors of bright galaxies and the mean colors of their faint companions in a cluster WHL J085910.0+294957 at z = 0.3, using the photometrically-selected cluster members. They suggest that such correlation may be the vestige of infallen groups in the cluster as one possibility. In order to confirm the small-scale conformity in galaxy clusters with higher reliability, we study the Virgo cluster using the Extended Virgo Cluster Catalog (EVCC). The cluster members are selected spectroscopically unlike in WHL J085910.0+294957. We examine the galactic conformity in two distinct