correspondence method, our method predicts more satellite galaxies close to their host halo center and larger pairwise peculiar velocity of galaxies. As a result, our method reproduces the observed galaxy group mass function, the number of member galaxies, and the two-point correlation functions while the subhalo-galaxy correspondence method underestimates them.

[구 GC-06] Synchrotron Emission Modeling of Radio Relics in the Cluster Outskirts

Hyesung Kang[1], Dongsu Ryu[2]
[1]Dept of Earth Sciences, Pusan National University, [2]Dept of Physics, UNIST

Radio relics are diffuse radio sources found in the outskirts of galaxy clusters and they are thought to trace synchrotron-emitting relativistic electrons accelerated at shocks. We explore a diffusive shock acceleration (DSA) model for radio relics in which a spherical shock with the parameters relevant for the Sausage radio relic in cluster CIZA J2242.8+5301 impinges on a magnetized cloud containing fossil relativistic electrons. This model is expected to explain some observed characteristics of giant radio relics such as the relative rareness, uniform surface brightness along the length of thin arc-like radio structure, and spectral curvature in the integrated radio spectrum. We find that the observed surface brightness profile of the Sausage relic can be explained reasonably well by shocks with speed $u_s \sim 3\times10^3 \mathrm{km/s}$ and sonic Mach number $M_s \sim 3$. These shocks also produce curved radio spectra that steepen gradually over $(0.1-10)\nu_{br}$ with a break frequency $\nu_{br} \sim 1\mathrm{GHz}$, if the duration of electron acceleration is $\sim$60-80 Myr. However, the abrupt increase in the spectral index above $\sim$1.5 GHz observed in the Sausage relic seems to indicate that additional physical processes, other than radiative losses, operate for electrons with the Lorentz factor, $\gamma_e > 10^4$.

[구 GC-07] Compact Stellar Systems and Dwarf Galaxies in the Pandora's Cluster Abell 2744

Myung Gyoon Lee (이명균), In Sung Jang (장인성),
Department of Physics and Astronomy, Seoul National University

Abell 2744 is a giant merging cluster, called the Pandora's Cluster, at the redshift of z=0.308 (corresponding to a distance of 1270 Mpc). Taking the advantage of the deep high resolution images in the Hubble Frontier Field program, we study the properties of compact stellar systems including globular clusters and ultracompact dwarfs (UCDs) as well as dwarf galaxies in this cluster. We find a rich population of globular clusters and UCDs in Abell 2744. The spatial distribution of these objects is consistent with the mass map derived from lensing analysis, while showing a significant offset from the X-ray map of hot gas. The faint end of the luminosity function of the galaxies in the red sequence is fit by a flat slope, showing no faint upturn. We discuss these finding in relation with the origin of UCDs, formation of red sequence dwarf galaxies, and formation of the Pandora's cluster.

[구 GC-08] Kinematic properties of the Ursa Major Cluster

YoungKwang Kim[1], Young Sun Lee[1], Timothy C. Beers[2]
[1]Department of Astronomy and Space Science, Chungnam Natonal University, Daejeon 34134, Korea, [2]Department of Physics and JINA Center for the Evolution of the Elements, University of Notre Dame, Notre Dame, IN 46556, USA

We present a kinematic analysis of 172 likely member galaxies of the Ursa Major Cluster. In order to understand the dynamical state of the cluster, we investigate the correlation of the cluster morphology with rotation, the velocity dispersion profile, and the rotation amplitude parallel to the global rotation direction. Both the minor axis and the rotation are very well-aligned with the global rotation axis in the outer region at half radius (> 0.5 R_{max}), but not in the inner region. The cluster exhibits low velocity dispersion and rotation amplitude profiles in the inner region, but higher in the outer. Both profiles exhibit outwardly increasing trends, suggesting an inside-out transfer of angular momentum of dark matter via violent relaxation, as revealed by a recent off-axis major-merging simulation. From Dressler-Schectman plots in the plane of galactic positions, and velocity versus position angle of galaxy, we are able to divide the Ursa Major Cluster into two substructures: Ursa Major South (UMS) and Ursa Major North (UMN). We derive a mass of $3.2\times10^{14} M_{\odot}$ for the cluster through the two-body analysis by the timing argument with the distance information (37 for UMN and 36 for UMS)