

Formation of Star Clusters in the Interacting Regions Between the Dwarf Galaxy and the Giant Elliptical galaxy

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It is expected that some star clusters are formed during interactions between galaxies. In this paper we present such a case. UGC 7636 is a dwarf irregular galaxy located at $5'.6$ (corresponding to 29kpc in the linear scale) south-east of the giant elliptical galaxy M49, the brightest member in the Virgo cluster.

We have investigated in detail the color structure of UGC 7636 and the interacting regions between the two galaxies using the deep Washington CT_1 images. We have found the followings: 1) UGC 7636 is tidally distorted and the tidal tails and counter-tidal tails are much bluer than the other regions, indicating recent star formations in the interacting regions; and 2) There are ≈ 8 bright blue point sources with colors $(C-T_1) \approx 0$ and $-8.5 < M_{T_1} < -10.5$ mag in the interacting regions. These objects are believed to be young star clusters formed recently during the interactions between the two galaxies.

Using these results, we will discuss the relations of the young star clusters with the globular clusters in M49 and the cluster formation history for M49-UGC 7636 system.

Numerical results of 3-Body Gravitational lenses.

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Gravitational microlensing by two stars in a macro-deflector (e.g. galaxy) has been investigated for the various values of surface mass density and mass ratio between two stars.

We present the morphology of multiple lensed images for an extended source. For the mapping between the deflector plane and the source plane, we derive a new transformation equation from the normalized lens equation.

Theoretical light curves are also calculated for the different sizes of an extended source.