

The Stellar Mass Function of Galaxy Clusters in the eROSITA Final Equatorial Depth Survey

In this project, our goal is to measure the stellar mass function of galaxy clusters selected in X-rays in the eROSITA Final Equatorial Depth Survey (eFEDS), which is the deepest X-ray survey over a contiguous footprint.

The sample consists of galaxy clusters spanning a mass range of $10^{13} h^{-1} M_{\odot} \leq M \leq 10^{15} h^{-1} M_{\odot}$, and a redshift range of $0.1 < z_{cl} < 1.2$.

We use photometric data from the WISE W1 band at $3.4 \mu\text{m}$, as it lies near the peak of the blackbody radiation curve for galaxies dominated by old stellar populations. The full-sky coverage of WISE also enables us to extend our measurements from the eFEDS sample to upcoming all-sky cluster catalogs.

As a first step, we used the WISE galaxy catalog to measure the magnitude distributions of eFEDS clusters and performed masking corrections. In parallel, we derived metallicities from a metallicity–luminosity relation, and constructed red-sequence models by interpolating the metallicity onto a grid of composite stellar population (CSP) models. From these models, we obtained the corresponding mass-to-light ratios, which enables the stellar mass estimates of the cluster sample. In this meeting, we will present our preliminary results.

Section

Cosmology

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