



Fig. 1: A galaxy cluster in a Large Scale Structure context (simulation); Galaxy clusters as cosmological probes; and comparison of star formation history of galaxy in clusters and field.



Fig. 2: Luminosity function of Central galaxies (BCGs) and Satellites (Other cluster members). Figure extracted from Trevisan & Mamon, 2017

constrain cosmological parameters (Fig 1);

 Also, they are unique laboratories to understand astrophysical processes associated with the galaxies and the hot intracluster medium (ICM);

- The first galaxy formed in a cluster is the Brightest Cluster Galaxy (BCG). BCGs show distinctive properties of luminosity, color, and mass (Fig 2).
- In the last decades, a large volume of data became available due to photometric surveys (Fig 3), which made the systematic search for galaxy clusters possible









- Bayesian probabilistic model of a given galaxy being a BCG;
- Candidates are selected by the following conditions:

1)  $M_{*}^{i} > M_{*}^{*} \sim 10^{11} M_{\odot}$ 

 $d_{c}[z_{BCG} + \sigma_{NMAD}(1+z_{NMAD})]$ 



Priors



• It is possible to select a sample of BCGs with ~75% of completeness and purity

• For a sample with BCG completeness = 100%, the purity is ~28%, but most of the

## Perspectives

- After finding BCGs:
  - Additional probabilistic criteria to search for the others cluster members
  - Establish cluster properties
  - Construct a catalog and compare with others in the literature



- Araya-Araya et al. 2021
- Bocquet et al. 2019
- Trevisan & Mamon, 2017
- Wang et al. 2018