Several galaxy properties are driven by stellar masses and their distribution. We present the galaxy stellar mass function in clusters from $z=0.8$ to $z=0$ for different morphological types. We find that both the total mass function and those of the different morphological types evolve noticeably with $z$. Examining the Morphology-Mass relation, we find it evolves with $z$ too, according to the evolution of the morphological fractions.

**The Mass Function of Different Morphological Types**

The mass distribution of each morphological type evolves with redshift. All types have proportionally more massive galaxies at high-$z$ than at low-$z$. All distributions are statistically very different.

**Ellipticals**: at both $z$ the mass distribution starts rather flat at $M > 10^{11} \text{M}_\odot$, with a hint for a possible dip in EDisCS, then begins to be steeper. As for the total mass function, there is a deficit of less massive galaxies $M > 10^{11} \text{M}_\odot$ at high-$z$, compared to WINGS, for the same number of more massive galaxies.

**S0s**: the mass distribution changes dramatically with $z$. WINGS galaxies have a flat mass function up to $M > 10^{11} \text{M}_\odot$, and then this becomes steeper. The mass function of EDisCS galaxies shows a rise, a peak at about $M > 10^{11} \text{M}_\odot$, and a fall.

**Late-types**: while the mass distribution of high-mass galaxies is rather similar at the two redshifts, the dearth of galaxies with $M > 10^{11} \text{M}_\odot$ in EDisCS is even more blatant than in the total mass function.

**Discussion and Conclusions**

The evolution of the galaxy stellar mass function can be due to several factors: a) strong environmental mass segregation, for which galaxies infalling into clusters between the two redshifts have a different mass distribution than galaxies already in clusters at high-$z$ (infalling galaxies being on average less massive); b) mass loss from massive galaxies due to harassment; c) galaxy mergings; d) mass growth due to star formation e) the morphological transformation from one type to the other.

To test the importance of these mechanisms and see if they co-work, we built a toy model in which, starting from the EDisCS mass function, we predict the cluster mass function at $z=0$. We consider the field mass function of Bundy et al. (2005) and hypothesize that galaxies can enter the clusters from the field maintaining their mass distribution. Then, we include the mass star forming galaxies (both of those already in clusters and of those infalling) grow due to star formation (following the SSR-Mass relation of Noeske et al. 2007) for 3 Gyr. Finally, we compare our result with the WINGS mass function and find that the shape of the distribution is very similar, indicating that actually star formation can fill the observed gap between the mass functions. Anyway, this model doesn’t consider the morphological transformations, that certainly occur.

**So, we conclude that the most likely explanation of the observed evolution of the mass functions is the mass growth of galaxies due to star formation in both cluster and, most of all, in infalling galaxies. This process has to be accompanied also by the morphological transformation from one type to the other.**

**References**


**http://web.oapd.inaf.it/wings**