The intriguing life of massive galaxies
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Structure and dynamics of massive galaxies at z=0 in a fully cosmological simulation

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In this contribution we present the results of an Eulerian adaptive mesh refinement (AMR) hydrodynamical and N-body simulation in a ΛCDM cosmology. The simulation used was performed with the cosmological code MASCLET (Quilis *et al.* 2004). Galaxies have been identified in the simulation outputs by means of an adaptive friends of friends algorithm applied to the star particles. To give light to our virtual galaxies we have assigned a spectrum to each stellar particle using the MIUSCAT stellar population models (Vazdekis *et al.* 2012; Ricciardelli *et al.* 2012).

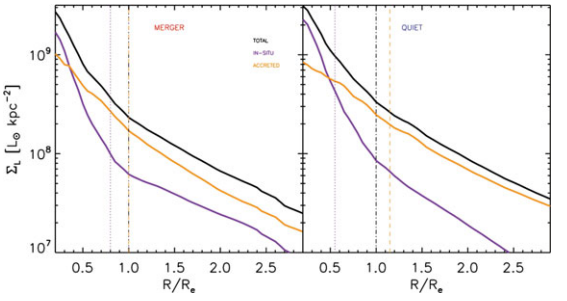

Figure 1. Median luminosity density profiles for three merger (*left-hand panel*) and three quiet (*right-hand panel*) galaxies. The contribution from stars formed in-situ and ex-situ are shown by the orange and purple lines, respectively. Vertical lines indicate $1R_e$ of the components: total (black, dot-dashed), in-situ (orange, dashed) and ex-situ (purple, dotted).

We focus our analysis on the most massive galaxies ($M_{star} > 10^{11} M_\odot$) in the simulation at redshift $z = 0$ and discuss their properties according to their morphological types, merging histories and dynamical properties (Navarro-González et al., in prep.). The most important factor in shaping the present-day structure of our simulated galaxies turns out to be the merging history. Indeed, galaxies having undergone an important merger event exhibit kinematical and metallicity gradients significantly different from those galaxies having experienced a more quiet life. We also study the accretion history of the galaxies in our sample, by classifying the stellar particles according to whether they formed in the main progenitor (in-situ) or formed outside it and were accreted later-on (by mergers or smooth accretion). As shown in Figure 1, the two populations of stars exhibit very different luminosity profiles. In the very central regions ($r < 0.5R_e$), the light distribution is dominated by the in-situ stars, whereas the outskirts are shaped by the accretion of stars formed outside the main body of the galaxy.

References

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