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The stellar halos of dwarf galaxies using the Auriga simulations

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Motivation

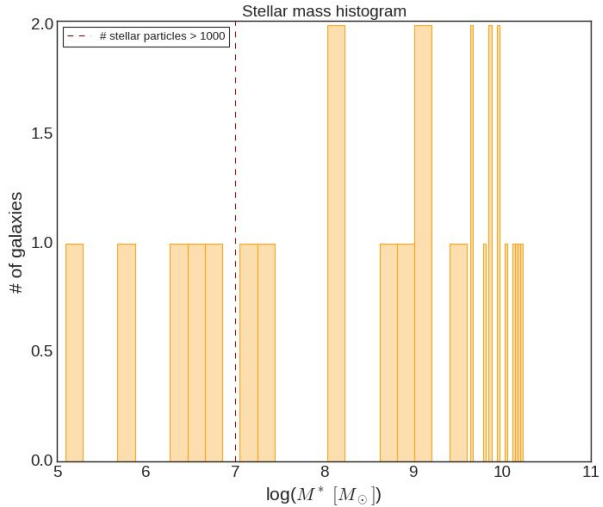
Low-mass galaxies are predicted to show observational evidence of satellite accretions (e.g. Diemand et al. 2007). The detection and characterization of stellar halos and substructure in dwarf galaxies would present another crucial piece of evidence that the current structure formation theory works on all scales. This prediction is poorly constrained by observations and stellar halos of low mass galaxies have not been much studied in detail from a theoretical point of view, given the high resolution required to analyze them with cosmological simulations.

Auriga simulations (Grand et al., 2017)

The Auriga Project consists of cosmological magneto-hydrodynamical zoom-in simulations of high resolution of the formation of galaxies. We use the new set of low-mass galaxies available, with DM halos ranging from $5\times10^{9}M_{\odot}$ to $5\times10^{11}M_{\odot}$ and a resolution of 10^{3} for the baryonic mass.

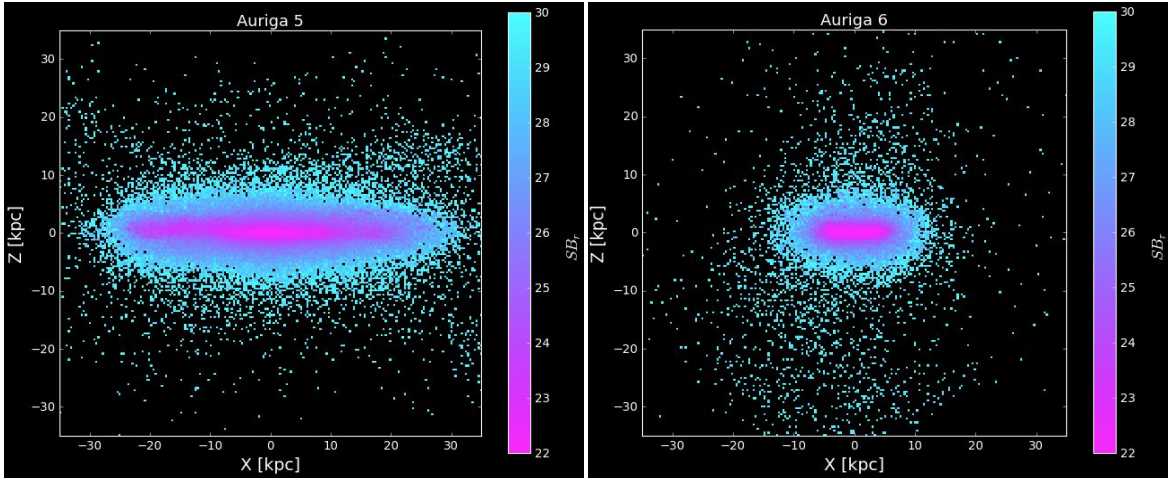
Future work

We plan to characterize the stellar halos of these low-mass galaxies using the Auriga simulations. We aim to determine their density and metallicity profiles, as well as characterize their accreting history.



Stellar mass histogram of all the Auriga low-mass galaxies. We will only analyze the stellar halos with $M^* > 10^7 M_{\odot}$, indicated with the vertical dashed line, since those with lower masses have less than 1000 stellar particles.

Examples of surface brightness maps



Edge-on surface brightness maps of the Auriga 5 and Auriga 6 low-mass halos.