Sven de Rijcke

Title: Stellar population in dwarf galaxies

Abstract: Dwarf galaxies are key laboratories in the study of the physical processes that drive galaxy formation. Because of their small masses, they are sensitive to internal processes, such as star formation and supernova feedback, and external agents, such as interactions and the cosmic UV background (UVB). Numerical simulations based on the Lambda-CDM cosmological model, are able to reproduce many of the observable properties of dwarf galaxies. For instance, supernova feedback in combination with the UVB is able to strongly suppress the luminous content of dwarf halos, bringing simulations in agreement with the M_star vs. M_halo relation inferred from abundance matching between observations and dark-matter-only simulations. However, tensions between dwarf galaxy simulations and observations remain, especially regarding their star-formation histories.

To date, CMD data have provided us with unprecedented insights in the star-formation histories of Local Group dwarfs which can already be used to disentangle the influences of the relevant physical processes. Integrated-light techniques have produced much coarser star-formation histories of dwarfs in the nearest groups and clusters, with only a handful of time bins. Still, they hint at intimate links between the internal dynamics of dwarfs and the composition of their stellar populations. The star-formation histories of dwarf galaxies in different environments (clusters, groups, field) provided by the E-ELT will serve as a crucial testbed for galaxy evolution simulations as well as for fundamental cosmology (e.g. the UVB) and allow us to refine the recipes used to describe star formation in simulated galaxies.