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VEGAS: VST survey of Early-type Galaxies in the Southern hemisphere

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In the era of deep photometric surveys aimed at studying galaxy structures down to the faintest levels of surface brightness of mu_g~27-30 mag/arcsec^2, the VST survey of Early-type Galaxies in the Southern hemisphere (VEGAS, see http://www.na.astro.it/vegas/VEGAS/Welcome.html) is producing competitive results. First results have confirmed the feasibility of VEGAS to reach the faint surface brightness levels of 27 - 30~mag/arcsec^2 in the g band out to about 10 Re (Capaccioli et al. 2015; Spavone et al. 2017). Therefore, taking advantage of the deep photometry, we can address the build up history of the stellar halo by comparing the surface brightness profile and the stellar mass fraction with the prediction of cosmological galaxy formation. As part of VEGAS, the Fornax Deep Survey (FDS) at VST aims to cover the Fornax cluster out to the virial radius (~0.7 Mpc), with an area of about 26 square degrees around the central galaxy NGC1399, and including the SW subgroup centred on FornaxA. FDS is a joint project based on VEGAS (P.I. E. Iodice) and the OmegaCam GTO (P.I. R. Peletier). One of the priority science goals of VEGAS and FDS is to study the faint outer regions of the massive galaxies in groups and clusters. The large mosaics obtained with the 1 square degree field-of-view pointings of OmegaCam at VST, plus the high angular resolution of 0.21 arcsec/pixel and the large integration time allow us to study, on the cluster scale, the galaxy structure from the brightest inner regions to the faint outskirts, where the stellar envelope merges into the intracluster light. The deep observations can be directly compared with the predictions from the up-to-date theories for the stellar halo formation and the relation with the galaxy environment (Iodice et al. 2016, 2017a, 2017b). Besides, the deep and multiband imaging of the VST surveys cited above allows us to derive the spatial distribution of candidate GCs (see D'Abrusco et al. 2016; Cantiello et al. 2017).

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