

# Cluster cosmology with Dark Energy Survey

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Galaxy clusters have long proven to be a valuable cosmological tool: arising from the highest peaks of the matter density field, they are a sensitive probe of the growth of structures and cosmic expansion. Current and upcoming wide-area photometric surveys —e.g. the Dark Energy Survey (DES), the Hyper Suprime-Cam Subaru Strategic Program, the Large Synoptic Survey Telescope, Euclid—seek to use the abundance and spatial distribution of galaxy clusters to improve constraints on the dark energy and the late-time normalization of the matter power spectrum. One of the main limitation for the exploitation of such a large dataset is our capability of recovering unbiased cluster mass estimates from observable mass proxies; a task especially challenging in case of optically selected clusters. In this talk I will review the work I have been carrying out in the last few years aimed at the characterization and analysis of the DES photometric cluster catalogs, with focus on the systematics affecting optical cluster catalogs and the opportunities and challenges for the exploitation of forthcoming photometric cluster surveys.

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