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Star formation, starbursts and quenching across the Coma supercluster

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We analyse Spitzer MIPS 24micron observations, and SDSS (DR7) optical broadband photometry and spectra, to investigate the star formation (SF) properties of galaxies residing in the Coma supercluster region. We find that SF in dwarf galaxies is quenched only in the high density environment at the centre of clusters and groups, but passively-evolving massive galaxies are found in all environments, indicating that massive galaxies can become passive via internal processes. We find AGN activity is suppressed in the cluster cores. We present evidence for a strong dependence of the mechanism(s) responsible for quenching SF in dwarf galaxies on the cluster potential. We find a significant increase in the mean EW of Halpha among star-forming dwarf galaxies in the infall regions of the Coma cluster and the core of Abell 1367 with respect to the overall supercluster population, indicative of the infalling dwarf galaxies undergoing a starburst phase. We identify these starburst galaxies as the precursors of the post-starburst k+A galaxies. We find that 11.4% of all dwarf (z mag > 15) galaxies in the Coma cluster and 4.8% in the Abell 1367 have k+A like spectra, while this fraction is just 2.1% when averaged over the entire supercluster region. We show that in the centre of the Coma cluster, the (24-z) colour of galaxies is correlated with their optical (g-r) colour and Halpha emission. By analysing the projected phase space distribution of galaxies detected at 24micron in Coma, we find that the (optically) red 24 micron detected galaxies follow the general distribution of `all' the spectroscopic members, but their (optically) blue counterparts show interesting features, indicative of recent infall.

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