Dusty Early-Type Galaxies in the Nearby Universe

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Abstract

As the likely end stages of galaxy evolution, local early-type galaxies (ETGs) are important to study for their structure and interstellar medium. Whilst dust was not expected to occur in significant quantities in ETGs, dust is detected and its characteristics may hold clues to the recent evolution of ETGs. A complete survey of 3 equatorial field regions, to z< 0.06 allowed us to obtain a census of the dust content of ETGs, based on sub-mm Herschel-ATLAS and multi-waveband GAMA survey data. This talk summarises the main findings and trends amongst those ETGs, residing mostly in group environments. Contrast is made with ETGs residing in dense clusters, notably the Virgo cluster. The Herschel-ATLAS/GAMA sample revealed surprisingly dusty ETGs. However, the sub-mm emission was not well resolved. Based on expected dust extents, we obtained ALMA observations for 5 cases, aimed at mapping the dust and molecular gas. I will present our findings of extensive molecular gas discs and lack of dust detections in these ALMA observations and explain these findings. Finally, I will highlight current progress in refining and augmenting these ETG data, based on what we have learnt.

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