

First dust and gas insight in late stage galaxy evolution

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Quiescent galaxies (QGs) have traditionally been viewed as the endpoint of galaxy evolution, characterized by the cessation of star formation and the rapid depletion of gas and dust in the interstellar medium (ISM). However, over the past decade, infrared and sub-millimeter observations have challenged this picture by revealing the presence of dust or cold gas in a subset of quiescent systems, particularly at high redshift. The James Webb Space Telescope (JWST) began operations at the start of my PhD and has since transformed this field by uncovering a larger and earlier population of QGs than previously expected. These discoveries have opened new questions about QGs: how do they form? Do they evolve after quenching? Does quiescence truly represent a terminal phase of galaxy evolution?

In this short seminar, I will provide an overview of this emerging field and its implications for galaxy evolution and population studies. I will place particular emphasis on the survey we performed with the sub-mm ALMA telescope, which constitutes the first large sample of quiescent galaxies with simultaneous detections of both cold molecular gas and dust beyond the local universe. I will discuss how these data, in synergy with JWST observations and state-of-the-art simulations, offer new insight into the residual ISM of quiescent galaxies and its role in their post-quenching evolution.

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