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Title: *Deconstructing the Hubble sequence with JWST: galaxy morphology transformation v. star-formation quenching since the end of cosmic dawn*

Abstract:

Well documented over ≥12 billion years (e.g. Davidson et al 2017), the continuous increase of the fraction of quiescent galaxies (where star formation has stopped) is the statistic expression of the *quenching* —i.e. the permanent shutdown— of star formation in galaxies. Such permanent quenching of the star formation requires, however, mechanisms able to suppress and prevent the cold-gas infall, which one may expect to vary depending on galaxies properties.

The diversity of quiescent galaxies (e.g. in terms of stellar mass and morphology) pleads indeed for the coexistence of different quenching channels (Faber et al. 2007, Peng et al. 2010, Schawinski et al. 2014, Moutard et al. 2016b). In particular, the physical processes at play in the delayed-then-rapid quenching of young, low-mass satellites are expected to be quite different from those driving the slow quenching of massive galaxies after billion years of stellar mass assembly. Often put forward, processes like, e.g. galaxy mergers, AGN feedback, starvation or ram-pressure stripping, are expected to differentially affect galaxies star formation and morphology.

I will present unprecedented analysis of the connection between the star formation quenching and the morphological transformation of galaxies since z ~ 3-4, drawing on the deepest, sharpest near- and mid-infrared observations ever conducted (even) with JWST (respectively, ~29 and 31mag at 3.6 and 5.6μm), as part of the MIRI Guaranteed Time Observations, combined with ultra-deep HST imaging over the HUDF. I will characterise the co-evolution between galaxies sSFR and morphology through the green valley, depending on their stellar mass, and discuss the different quenching scenarii that our results support across cosmic time over the last ~12 billion years.