

## The populations of star forming and quenched galaxies

Galaxies having little to no active star formation are termed "quenched" but the definition of "quenched" varies widely through the literature. Moreover, the galaxy star formation sequence itself, whether predicted from simulations or observed, varies depending on the dataset and the star formation and quenching indicators used.

We explore star formation and quenching of galaxies in a large observational dataset plus numerous independent sets of simulated galaxies from large-scale and zoom cosmological simulations. We describe the populations in the star formation rate - stellar mass plane and discuss the differences between the datasets. Moreover, we build mock galaxy spectra for all simulated galaxies and compare the observational star formation and quenching indicators for the mock galaxy spectra to the galaxy properties in the simulations and to the star formation and quenching indicators for observed galaxies.

We describe the galaxy star forming sequence and population of quenched isolated galaxies in theoretical predictions, mock observations, and observational data, how to define "quenched" in a consistent way, and the implications of this comparison on the star formation and feedback processes in galaxies.