

The impact of stellar bars on quenching star formation: insights from a spatially resolved analysis in the local Universe

Stellar bars are present in about two-thirds of disc galaxies in the local Universe and are believed to play a crucial role in secular evolutionary processes, since they efficiently redistribute gas, stars and angular momentum within their hosts.

In this talk, I will present the main results obtained from a spatially resolved analysis of a sample of six nearby barred galaxies, performed with the aim of exploring the potential impact of bars on quenching star formation at sub-kpc scales.

To this purpose, we collected multi-wavelength photometric data from the DustPedia archive and a SED fitting procedure was applied on square apertures of fixed angular size. For each galaxy we obtained the distributions of stellar mass and star formation rate surface densities and related them deriving the spatially resolved Main Sequence (MS) relation. Although galaxy-to-galaxy variations are in place, we revealed a common less star forming track in correspondence to the bar hosting region, which is in anti-correlation with respect to the best-fit MS.

Such a quiescent signature could be interpreted as the outcome of a bar-driven depletion of central gas reservoirs and a consequent halt of star formation, supporting the inside-out quenching scenario.

In the end, I will discuss future perspectives to extend these spatially resolved studies to larger samples of galaxies with different morphologies and at higher redshifts, exploiting JWST data. A proper selection and analysis of JWST data could also be crucial for identifying ideal extragalactic science cases to simulate the promising performances of MORFEO+MICADO at ELT.

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Galassie e Cosmologia

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