Star formation within bars of nearby galaxies

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Abstract / Approximately two thirds of the galaxies in the Local Universe host bars, which are elongated or oval-shaped stellar structures in their central regions. There is no clear understanding of how the local dynamical conditions influence the star formation (SF) activity within bars. Bars have different distributions of SF regions along them, which can depend on morphological and physical parameters of their host galaxies. In this work we analyse the SF distributions along bars and carry out a statistical analysis to investigate relations between bars and global properties of their host galaxies. We analysed the distribution of SF inside 759 bars of galaxies with moderate inclinations, from the *Spitzer Survey of Stellar Structure in Galaxies* (S⁴G). To this end, we used far-ultraviolet (FUV) and continuum-subtracted H α images of galaxies as tracers of recent star formation. We also used measurements of the gravitational torques of bars, total stellar mass and relative content of gas from the host galaxies. We found that the spatial SF distribution clearly depends on both morphological and physical parameters. At the centres of bars, SF is the most frequent in early-type, massive and gas-poor galaxies with low-torque bars. At the bar ends, this occurs in intermediate-type and massive galaxies with a moderate amount of cold gas. Finally, along bars SF is more common in late-type, low-mass and gas-rich galaxies with high-torque bars.

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