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Unveiling the baryonic structure and evolution of local star forming discs

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In the literature, large amount of work has been devoted to the study of the build-up of metals and dust in disc galaxies. However, most of these analyses are based on global galactic properties. Therefore, spatially resolved studies are crucial to provide more detailed information on the evolution processes affecting these star forming galaxies.
In this talk, I will present a spatially resolved study of the relations between stellar, gas, star formation rate (SFR), dust surface densities and chemical abundances in the nearby spiral galaxies M101, NGC628, M33 and NGC300. This selection allow us to probe objects showing diverse characteristics, from the morphology to the stellar mass.
We re-derived stellar, gas, SFR and dust radial profiles within this galaxy sample and explored the obtained relations between the different physical quantities. These quantities are then related with literature data of different chemical abundances (i.e. carbon, nitrogen, oxygen) available for this sample that can tell us about the relative roles played by gas flows and the star formation history in these systems.
To this aim, we also performed a detailed analysis by running state-of-the-art, multi-zone galactic chemical evolution models including dust evolution for the studied galaxies. The models are calibrated by means of a Bayesian analysis to fit the observed stellar, gas and SFR profiles and allowed us to pin down the main events characterising the star formation history as well as to better constrain the highly uncertain processes regulating dust evolution.

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