A cloud-scale view of molecular gas and star formation

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Star formation is a vital process for stellar mass growth during the evolution of galaxies. Our understanding of where stars form and how their formation is regulated across galactic disks is surprisingly incomplete. In order to resolve the sites of recent (or future) star formation and sample the time evolution of the star formation process, high spatial resolution observations of nearby galaxies are required that reach the scales of the star-forming units, namely giant molecular clouds and HII regions. With the advent of major astronomical facilities such as ALMA, JWST, HST, and VLT/MUSE, it is now possible to probe the molecular gas reservoir, dust and embedded star formation, young stellar clusters and stellar feedback at comparable resolution.

I will introduce the PHANGS (Physics at High Angular resolution in Nearby GalaxieS) survey that is assembling a comprehensive database to study the baryonic matter cycle in galaxies and present our emerging picture of the star formation process with a focus on the team's research.