

On the Nature of Star Forming Regions as a function of Galactic Dynamics

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The structure and dynamics of disk galaxies govern the evolution of the interstellar medium (ISM) at small scales, and are thus at the root of the process of star formation. Using a fully-consistent hydrodynamic simulation of a Milky Way-like galaxy at subparsec resolution, we explore the formation and evolution of gas clouds in the galactic bar and along spirals, down to the shaping of interstellar filaments hosting star forming cores. In particular, we highlight the organization of the ISM into two families of regularly spaced structures: the beads on a string and the spurs. The differences in the physical conditions at the epoch of their formation lead to different morphologies and different properties for the star forming regions they host. In this contribution, I will present the connection between the organization of the ISM and the local environment taking these families as examples. I will discuss the role of gravitational instabilities, turbulence cascade and shear in several environments within a galactic disk, and their impact on star formation.