

[초IS-02] Spiral Structures in Disk Galaxies

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Spiral arms are the most outstanding morphological features in disk galaxies. They not only provide information on the dynamical states of the background stellar disks, but also affect galactic evolution by triggering large-scale star formation in the gaseous component. Over past fifty years, a significant progress has been made in our understanding of spiral arms and associated star formation. Still, there remain outstanding questions regarding the nature, origin, pattern speed, and strength of spiral arms, and their effect on the gaseous medium. For instance, are spiral arms long-lived or transient? What drives spiral arms? Do arms rotate rigidly enough to construct a pattern? What effect do they make on the formation of spiral-arm substructures? How do they interact with fluid instabilities to generate turbulence in the interstellar medium. Is the presence of spiral arms enhance the galactic star formation or just organize it? In this talk, I will first review heuristically the theories of spiral structures and then present our recent efforts and results on the questions listed above.