

# Spiral Structure in Galaxies

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Recurrent spiral patterns in galaxy disks redistribute angular momentum, increase random motions, cause radial mixing, smooth rotation curves, amplify the magnetic field, *etc.* I present a general assessment of our understanding of the origin of spiral patterns in galaxies, with a strong focus on the nature of the transient patterns in simulations. The picture that may ultimately emerge is one in which the spiral patterns are true instabilities of a non-smooth disk, and the saturation and decay of one instability seeds the growth of another. Future ground- and space-based surveys to measure the kinematics and chemistry of stars across the Milky Way will yield data that could confirm or refute this idea.