The Epoch of Disk Formation: z~1 to Today

We present data on galaxy kinematics, morphologies, and star-formation rates over $0.1< z < 1.2$ for ~500 blue galaxies. These data show how systems like our own Milky-Way have come into being. At redshifts around 1, about half the age of the Universe ago, Milky-Way mass galaxies were different beasts than today. They had a significant amount of disturbed motions, disturbed morphologies, shallower potential wells, higher specific star-formation rates, and likely higher gas fractions. Since redshift ~1, galaxies have decreased in disturbed motions, increased in rotation velocity and potential well depth, become more well-ordered morphologically, and decreased in specific star-formation rate. We find interrelationships between these measurements. Galaxy kinematics are correlated with morphology and specific star-formation rate such that galaxies with the fastest rotation velocities and the least amounts of disturbed motions have the most well-ordered morphologies and the lowest specific star-formation rates. The converse is true. Moreover, we find that the rate at which galaxies become more well-ordered kinematically (i.e., increased rotation velocity, decreased disturbed motions) and morphologically is directly proportional to their stellar mass.

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