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Star Formation, GMCs, and Galaxies

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Room AG69

Star formation on galactic scales is observed to be a slow process, a result known as the Kennicutt-Schmidt relation. I will argue, using observations, simulations, and analytic theory, that the star formation on smaller scales, those of Giant Molecular Clouds (GMCs), increases with GMC age. I will show, using a new GMC catalog, that GMCs in the "five kiloparsec ring" of the Milky Way are contracting under self-gravity, and argue that this collapse is halted and reversed by feedback from star clusters. I will then describe the results of the FIRE simulations, which show that in galaxies with higher gas surface density, and hence more massive GMCs, the feedback not only disrupts the GMCs, it drives winds from the simulated galaxies; at high redshifts, the simulated winds remove the interstellar medium of the galaxy, halting star formation for a dynamical time. Upcoming CO intensity mapping experiments will test this prediction of the FIRE simulations.



Subha Majumdar
