

Poster: Twinkle little stars: Massive stars are quenched in strong magnetic fields

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I present a recent discovery of the role of the magnetic fields and cosmic rays in decelerating the formation of massive stars in the center of NGC1097. Full polarization VLA/radio continuum observations combined with the SMA/CO and the HST data, allowed us to separate the thermal and synchrotron emission, map the ordered & turbulent magnetic field strength, and investigate the energy balance on scales of giant molecular clouds. A comparison of the mass-to-magnetic flux ratio of the molecular clouds shows that most of them are magnetically supported against gravitational collapse needed to form cores of massive stars. Moreover, the star formation efficiency of the clouds drops with the equipartition magnetic field strength. Such an anti-correlation holds with neither the turbulent gas nor the thermal gas pressure. Magnetic fields supporting the molecular clouds prevent collapse of gas to densities needed to form massive stars. Instead, cloud fragmentation will continue to reach the regime for the low density gas to form many low-mass stars.

Galactic Scale