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Title:	Molecular Gas and Starbursts in the Circumnuclear regions of Sprial galaxies
Authors:	Jogee, S.
Affiliation:	AA(Yale University)
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Abstract

In my thesis, I investigate the properties of molecular gas and star formation in the circumnuclear (inner kpc) region of spirals. I analyze a sample of 10 nearby luminous starburst, and non-starburst galaxies using 2'' resolution interferometric CO (J=1->0) observations, in conjunction with ground-based and HST optical images, radio continuum, near-infrared, X-ray, and HI data. In particular, (a) I investigate where the extra mass ends up as gas reaches the inner few kpc by studying inflow processes, star formation, and outflow processes. I compare the distributions, kinematics, and star-forming efficiency of the molecular gas in relation to the stellar potential. In NGC 2782, I present evidence that a pair of nuclear bars is fuelling a powerful central starburst. I estimate the gas inflow rate and future evolution in order to probe the possibility that nuclear bars and the 'bar within bar' instability may be an efficient way to fuel central AGNs/starbursts. Mass outflows are as important as gas inflows for the evolution of the inner kpc. I present multi-wavelength evidence that NGC 2782 harbors a remarkable starburst-driven outflow which is dynamically very young. I compare the energetics of the hot, warm and cold phases of the ISM which the outflow is driving out of the central kpc. (b) I study the triggering and evolution of nuclear starbursts. I investigate why galaxies with comparable amount of circumnuclear molecular gas convert the gas into stars over timescales that differ by orders of magnitude. I present evidence that the gas consumption timescale may be correlated with the gas morphology and kinematics, and sketch likely evolutionary consequences. I show that gravitational instability models may describe the onset of star formation in the circumnuclear regions of some spirals. I examine the possibility that starbursts may be the normal mode of star formation in the centers of spirals.

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