Abstract Submitted
for the APR15 Meeting of
The American Physical Society

Densities of Galactic Center Clouds JONATHAN BARNES, Norfolk State University/ NRAO intern, ELISABETH A.C. MILLS, NRAO, MARK R. MORRIS, UCLA — The central 300 parsecs of the Galaxy is full of giant molecular clouds containing 107 solar masses worth of gas. However, our Galactic center is not forming as many stars as we think it can, based on the amount of molecular gas in this region. By studying the densities of the Galactic center clouds we hope to better understand why there is not much star formation occurring. Using data from the Green Bank and MOPRA telescopes we have observed multiple rotation transitions of HC3N and its 13C isotopologues. By measuring the integrated intensity of the HC3N we are able to calculate the densities of these giant molecular clouds. The measured intensities are used with a radiative transfer code called RADEX, to determine volume densities. Our initial results suggest that there may be either less dense or cooler gas in these clouds that previously thought. If there is a significant quantity of gas less dense than 104 molecules/cm3, this could explain the lack of ongoing star formation in these clouds, and might also suggest a shorter timescale for dynamical disruption of theses clouds. In the future, we plan to improve these results by observing additional HC3N transitions, allowing us better to constrain the relative contributions of multiple temperature and density components in Galactic center clouds.

Jonathan Barnes
Norfolk State University/ NRAO intern

Date submitted: 14 Nov 2014 Electronic form version 1.4