

Atomic Molecular and Optical Physics Seminar

November 16, 2007 at 10:30 noon

Physics 1305

“Buffer-Gas Cooling and Microwave Trapping of Polar Molecules”

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Cold and ultracold polar molecules promise to be ideal candidates for several experiments, including precision measurements, the creation of novel states of matter, and quantum computation. The complexity of molecular structure has prevented laser cooling from being successfully applied to molecules, prompting many groups to find alternative methods to reach these regimes. In the DeMille group at Yale, we recently constructed a 4 Kelvin buffer-gas cooled molecular beam with high brightness. This beam will serve as a starting point for trapping molecules in a high-power microwave resonator. I will review how the molecular beam is created along with measurements of the beam's properties (temperature, velocity, flux, etc.) I will also review our current attempts to electrostatically guide molecules, a design for the microwave cavity, and a technique for dissipatively loading molecules into the trap.