CSO SPECIAL SCIENCE SEMINAR

TIME: 11:00 AM, Monday 8th December 2008

PLACE: CSO Conference Room

TITLE: Observational Determination of the Turbulent Ambipolar Diffusion Scale in Molecular Clouds

SPEAKER: Prof. Martin Houde
Department of Physics and Astronomy, The University of Western Ontario (Canada)

ABSTRACT:

I will present a study of the turbulent velocity dispersion spectra (versus length scale) for the coexistent HCN and HCO+ molecular species in the M17 star-forming molecular cloud. I will show that the observed downward shift of the ion's spectrum relative to that of the neutral is readily explained by the existence of an ambipolar diffusion scale below which the motions of the ion and neutral components of the gas decouple from one another. For M17, this decoupling scale is measured to be 1.8 mpc; this is the first time that this fundamental quantity is determined observationally. Moreover, this result is in excellent agreement with previous theoretical predictions. I will also demonstrate how these observations can be used to estimate the strength of the plane-of-the-sky component of the embedded magnetic field in a completely novel way.

Caltech Submillimeter Observatory (CSO) Hilo office is located in the University Park, at the corner of Komohana – Nowelo Street.
111 Nowelo Street, Hilo HI 96720 (Phone: (808) 935-1909)