Tel Aviv University , Astronomy and Astrophysics Seminar

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UCHVC (Ultra-compact High Velocity Cloud) survey

The paucity of low mass galaxies in the Universe is a long-standing problem. We recently presented a set of isolated ultra-compact high velocity clouds (UCHVCs) identified within the dataset of the Arecibo Legacy Fast ALFA (ALFALFA) HI line survey that are consistent with representing low mass gas-bearing dark matter halos within the Local Group (Adams et al. 2013). At distances of ~1 Mpc, the UCHVCs have HI masses of ~10^5 Msun and indicative dynamical masses of ~10^7 Msun. The HI diameters of the UCHVCs range from 4' to 20', or 1 to 6 kpc at a distance of 1 Mpc. We have selected the most compact and isolated UCHVCs with the highest average column densities as representing the best galaxy candidates. Several of these systems have been observed with WSRT to enable higher spatial resolution (~40-60") studies of the HI distribution. The HI morphology revealed by the WSRT data offers clues to the environment of the UCHVCs, and velocity fields allow the underlying mass distribution to be constrained. I will present initial results comparing the observed HI distribution to theoretical models of gas in low mass dark matter halos. I will also highlight the discovery of Leo P as a HI detection in the ALFALFA survey.