

**Proposal Abstract:**

A considerable portion of local galaxies are satellites, whose evolution is influenced by group/cluster environments, but the details of different physical mechanisms at play are not clear, especially in intermediate groups. The HI is sensitive to environmental perturbations, and is the reservoir of star-formation material. A census of HI population in groups is indispensable to a full picture of satellite evolution. Previous statistical HI surveys covering whole groups are not deep enough or not homogeneous for studying dwarf galaxies deviating the HI main sequence. In a preparatory work (Lin+2023), we separated tidal and ram-pressure effects with a new method, using deep HI data of the NGC4636 group. The analysis needs to be extended to more groups for more-general conclusions. We propose to observe the HI in four representative  $\sim 1e13M_{\text{sun}}$  groups within 30Mpc. The groups will be contiguously mapped out to  $2r_{200}$ , with a 3-sigma depth uniformly reaching  $M_{\text{HI}}=10^{7.2}M_{\text{sun}}$ ,  $\sim 1$ dex deeper than ALFALFA at 28Mpc. We aim to comprehensively describe how the HI contents of satellites change due to different physical mechanisms, how the change leads to the variation in star formation and stellar properties, and how these are influenced by global group properties.