Proposal Abstract:

This pilot proposal aims to unprecedentedly map diffuse HI of starbursts in two 1 degree x 1 degree (~300 kpc x 300 kpc) areas centered around NGC 4713 and NGC 4808 to 3 sigma depth of N_HI = 2 x 10^17/cm^2. The two low-mass starbursts are located near each other in the low-density outskirt of virgo cluster, the nearest and richest galaxy cluster. The starbursts show multiple signatures that indicate they have extended HI halo that is accreting and fueling the starbursts. These signatures include extended HI disks, whose morphology and kinematics suggest strong and asymmetric warps and stellar lopsidedness. Our goals are: (1) to measure halo gas content of and gas accretion rates onto the two starbursts and their neighbors; (2) Quantitatively compare the spatial distribution HI in observed and simulated starbursts. We will measure HI density profile, kinematics, clumpiness, asymmetry, and second order statistics of FAST observations and starbursts in IllustrisTNG. (3) Study the interplay between HI properties and cluster and local environments. The mapped areas have and GAMA surveys and thus have deep optical-NIR imaging (Subaru HSC) and multi-wavelength data covering FUV-to-IR (Herschel), which are crucial for measuring reliable M*, SFR, substructural parameters, identifying dwarf neighbors.