

Proposal Abstract:

The circumgalactic medium (CGM), which connects the intergalactic medium with the interstellar medium, is essential to understanding the exchange of materials with the surrounding environment in the evolution of galaxies. HI emission can potentially trace the distribution and kinematics of cold gas stream in the CGM. However, due to its low surface density, past observations of CGM HI gas have been quite limited. Some works based on the GBT have confirmed the feasibility of observing CGM HI gas at the position of 100 kpc away from galaxies, but its single beam limits its ability to obtain comprehensive information. FAST is the most sensitive single-dish radio telescope, which can be a useful tool to detect the weak, diffuse HI gas around external galaxies. Unlike observations of individual sources, we can simultaneously use 19-beam to observe the CGM at different locations around the entire galaxy. The high sensitivity and observation efficiency of FAST enables us, for the first time, to thoroughly study the cold gas properties at such outermost regions of galaxies. We plan to focus on several edge-on galaxies, which contain different types of galaxies to study their gas distribution and dynamical properties of CGM.