

Proposal Abstract:

Environmental effects are critical for galaxy growth and evolution, which are traced by H I. We propose to map the atomic gas of five galaxies in the Virgo cluster using the FAST On-The-Fly (OTF) mode with a uniform field of view of $40' \times 40'$ ($200 \text{ kpc} \times 200 \text{ kpc}$) and a column density of $3 \times 10^{17} \text{ cm}^{-2}$ (a noise level is 0.21 mJy, 4σ detection). These five galaxies (NGC 4536, NGC 4698, NGC 4654, NGC 4569, and NGC 4216) are uniquely selected as having large H I radius and edge-on morphology, which are marginally resolved by FAST with 2-4 beams and covering five distinguishable stages of galaxy infall. Our main goals are to (1) trace the evolution of total gas mass in the CGM, (2) quantify and compare the evolution of H I radial distribution across five infall stages, and (3) detect new sources. Our proposal takes advantage of the high sensitivity and better spatial resolution of FAST, which are vital to mapping the CGM up to a radial distance of tens of kpc.