Proposal Abstract:

Hickson compact groups (HCGs) are unique laboratories for studying the effects of extreme multi-galaxy tidal interactions on the evolution of galaxies and the intragroup medium. To study the missing HI and early interaction history of HCGs, our previous FAST observations reveal a large diffuse HI structure with a column density down to ~10^17 cm^−2 at the southeast of HCG 100. We also found detectable HI at the southeast edge of the map, indicating connections to neighbor galaxies and even the IGM in the cosmic web around HCG 100. To study the extent and origin of the diffuse HI gas, we propose FAST deep observations to trace the edge of the extended HI emission of HCG 100 in the southeast direction. By deep mapping of diffuse HI with FAST, we aim to help understand: (1) Is the faint diffuse HI gas associated with neighbor galaxies and even the IGM in the cosmic web around HCG 100? (2) What is the early interaction/formation history of HCG 100 and surrounding neighbor galaxies? (3) How does the diffuse HI impact the formation and evolution of galaxies in and around HCG 100?