

Proposal Abstract:

The diffuse warm ionized medium (WIM) accounts for over 90% of all ionized hydrogen in the Galaxy, however, the origin of WIM is still unclear. Murray & Rahman 2010 identified a sample of the largest and most luminous HII regions in the Galaxy that are found to be surrounded by a large fraction of WIM. 84 of these largest and brightest HII regions with WIM are located in the FAST sky area, which provides a golden opportunity for the most sensitive radio sing-dish telescope FAST to contribute to this field. Using the FAST telescope, we observe the radio recombination line (RRL) toward the Top13 brightest HII regions with WIM located in the FAST sky area, to analyze the role of leaking ionizing photons from HII regions in the ionization and maintenance of the WIM. To test whether the scientific goals can be achieved or not, here we propose a pilot observation for simultaneously detecting 20 hydrogen and helium RRLs toward one HII region with WIM in the Top13 sample, requiring a total time of 8.3 hrs including 30% overheads.