Proposal Abstract:

The California molecular cloud is one of the most massive GMCs near the Sun with unusually low SFR. Given the very low SFR and low dense gas fraction in the California cloud, one may expect a strong internal turbulent environment. However, previous studies of the HI column density probability distribution function (N-PDF) didn't find evidence for strong turbulence in the California cloud. We propose to mosaic the HI observations over a large area (~60 square-degree) covering the California molecular cloud using FAST. Taking advantage of the high sensitivity and high velocity resolution of FAST, we can investigate the multi-phase turbulent environment using N-PDF analysis, especially the N-PDF of HINSA. By studying the turbulence that is closely associated with the molecular cloud, we may provide a reasonable explanation for the low star formation rate in California.