

Proposal Abstract:

Fast Radio Bursts (FRBs) are luminous, millisecond timescale radio transients known to originate from cosmological distances, and are presently of unknown origin, although magnetars are a leading progenitor candidate. Magnetars originate in core-collapse supernova events in young stellar populations, so the discovery of an FRB (FRB20200120E) from a globular cluster (GC) in the nearby disk galaxy M81 came as a surprise since GCs are an ancient population. We propose a FAST observation campaign to search for further FRBs from GCs, with a focus on a massive nearby giant elliptical galaxy, NGC 4472 (M49). It has a large family of approximately 7000 GCs and has been identified as the best target within 20 Mpc for GC FRB detections as it is radio-faint. By observing this target, we aim to understand FRB progenitors. It will consist of a 30-hour FAST observation of NGC 4472 and has a 90% chance of detecting at least one FRB. An FRB detection from NGC 4472 will provide valuable information about the physical processes that produce FRBs and the environments in which they occur.