

Proposal Abstract:

The Milky Way is estimated to contain billion neutron stars (NSs), with a subset of them in binary systems. However, characterizing the entire NS population is challenging because the majority of them are electromagnetically dim. Recent progress in optical observations has provided a new promising way to identifying NSs in detached binaries. A large number of NS candidates have been identified from the astrometry of Gaia. However, their nature remains unclear. Here we propose a targeted observation with FAST to search for radio pulsations in these detached binaries. We select 9 binaries with NS candidates from the Gaia astrometry. The dark objects of these binaries may be NSs or tight NS+white dwarf inner binaries within triples. Detection of radio pulsations will definitely confirm their nature, provide valuable constraints on the formation and evolution of NS detached binaries, and validate the feasibility of searching for compact stars through astrometry and radial velocity measurement.