

Proposal Abstract:

The Milky Way is estimated to contain $\sim 10^9$ 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 compact stars (including NSs) in binaries. A large number of NS candidates have been identified from the astrometric and spectroscopic data with Gaia and LAMOST. However, their nature remains unclear. Here we propose a targeted observation with FAST to search radio pulsations in these non-interacting binary systems. We select 15 binaries with compact star candidates from the Gaia and LAMOST astrometric and spectroscopic data. Detection of radio pulsations will definitely confirm their NS nature, provide valuable constraints on the formation of NSs in binaries, and validate the feasibility of searching for compact stars through radial velocity measurements.