

Proposal Abstract:

Neutron stars are formed as compact remnants of massive star which explode in supernovae at the end of their stellar life. In order to better understand the supernova explosion mechanisms and the equation of state of neutron star matter, knowledge of the distribution of masses of neutron star is vital. However, in order to weigh a neutron star it must be a member of a binary system. With its exquisite astrometric precision, the latest Gaia data release includes 10^5 astrometric binaries, each of which have measured orbital periods, eccentricities, and the Thiele-Innes orbital parameters. Using these and an estimate of the luminous star's masses, Andrews et al. (2022) derives the companion star's masses, from which they identify a sample of 24 binaries in long period orbits ($P_{orb} \sim \text{yrs}$) with a high probability of hosting a massive ($>1.4M_{sun}$), dark companion: a neutron star (NS) or black hole (BH). Here, based on high sensitivity observation of FAST, we propose to search for radio pulsations from these system within the area of the FAST