

Proposal Abstract:

Accreting millisecond X-ray pulsars (AMXPs) are a sub-group of neutron star low mass X-ray binaries (LMXBs), in which fast spinning neutron stars (> 100 Hz) accrete the matter from their donor stars via Roche lobe overflow. AMXPs are of great interest and have been under extensive study. They are unique laboratories for the research on extreme physics, and allow us to understand neutron stars and their evolution in the framework of the recycling scenario. They might also provide an opportunity to constrain the continuous gravitational waves and the equation of state of ultra-dense matter. In this project, we propose the FAST program to search the radio pulsations from the new-found AMXP, MAXI J1957+032 in quiescence. We also suggest to observe any known or unknown AMXPs within the FAST field of view when they just return to the quiescent state. The observational results would help us to constrain the magnetic field of the neutron star and its interaction with accretion flows. We will also explore the link between the LMXBs and typical transient millisecond pulsars, and give a further test for the recycling model.