Proposal Abstract:

We propose to time a group of millisecond pulsars (MSPs), which were not included in the international pulsar timing array (IPTA) or Chinese pulsar timing array (CPTA) list to increase the CPTA sensitivity to nano-Hertz Gravitational Waves by increasing the number and sky coverage of MSPs. More than 12 MSPs in CPTA were found by our former campaigns in CPTA DR1, helping CPTA find evidence of nano-Hertz Gravitational Waves! The current proposal is driven by the fact that some of the MSPs show better timing stability with FAST than the current IPTA pulsars. MSPs with low flux were not included in IPTA list, since the timing precision was limited by the signal-to-noise ratio for 100-meter level telescopes. However, with FAST, our previous observations show that the high sensitivity of FAST significantly reduces the error in pulsar timing; and some of those low-flux pulsars show better stability than pulsars included in IPTA list. Thanks to FAST sensitivity, those weaker MSPs will help CPTA to gain special privileges in gravitational wave detection, which is not possible for other PTAs using smaller telescopes.