Proposal Abstract:

Modeling the long-term variations to the diffractive scintillations provides a possibility to detect the orbit parameters: the inclination angle and the longitude of ascending node if a pulsar is in a binary system. Combining the other orbit parameters from pulsar timing is possible to determine the full three-dimensional orbital geometries of binary pulsars. It provides parameters essential for testing theories of gravity and constraining neutron star masses. The goal of this proposal is to select binary pulsars that exhibit significant interstellar scintillation at the observing frequency of 1.25 GHz. By analyzing these observations, we will construct a larger-scale census and then use it to search for the heaviest pulsar in the next FAST proposal circles by monitoring periodic variations in interstellar scintillation.