Proposal Abstract:

The FAST Galactic Plane Pulsar Snapshot (GPPS) survey program has currently discovered 162 millisecond pulsars (MSPs) with periods less than 30 milliseconds. The discovery and verification observations of these new MSPs only provide preliminary information on their period, dispersion measure, and low-precision position. Long-term timing observations are needed to obtain accurate ephemeris and other derived parameters for studying the birth, evolution, distribution and emission of MSPs. The timing residuals can be used to reveal possible glitches in MSPs, and select potential probes for detecting gravitational waves and establishing pulsar-based time-scale. Long-term timing can also verify whether MSPs are in binary systems. We apply timing observations for 33 bright MSPs discovered by GPPS to obtain accurate ephemeris and verify whether they are in binary systems.