

Proposal Abstract:

PSR J0435+3233 is a unique new MSP far above the maximum spin-up line in the P-Pdot diagram. It is a 3.20 ms pulsar discovered in the Commensal Radio Astronomy FAST Survey (CRAFTS). Its period derivative is about two magnitudes higher than those of all known MSPs. Hence, PSR J0435+3233 is a unique binary MSP that places stringent constraints on the spin-up process predicted by pulsar recycling theories. PSR J0435+3233 has significant timing noise, which may be contributed by the second companion star (triple system). Further observations help to study the timing noise and discern if there is a triple system and high-order derivatives of spin frequency that can be accurately measured.