

FAST Proposal Coverpage

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Project Name:

Searching for radio pulsations in the transitional millisecond pulsar
PSR J1023+0038

Project Summary:

The **unexpected** discovery of three “transitional millisecond pulsars” (tMSPs) that swing between accretion- and rotation-powered states has provided the conclusive evidence for the millisecond pulsar recycling scenario, but at the same time raised numerous questions on the exact mechanism of mass accretion onto a magnetized star. In the accretion state, tMSPs are characterized by **peculiar** emission properties from radio to gamma rays. PSR J1023+0038 is currently the only tMSP in the accretion state. Our recent discovery of optical pulsations suggests that PSR J1023+0038 is active as a rotation-powered MSP, despite the presence of an accretion disk around the pulsar. FAST observations will provide an **unprecedented sensitivity to search for the (so far undetected) radio pulsations** from this system, and nail it down as an active rotation-powered MSP.