



# Probing Deeper into the Milky Way for Pulsars\*

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The FAST radio telescope has significantly better sensitivity than any other current radio telescope. Consequently, FAST has discovered over a thousand new pulsars in sky regions already searched for 50 yr. The Galactic Plane Pulsar Snapshot (GPPS) survey found three-quarters of these new pulsars. The article by Han et al. (2025) details the latest batch of 473 discoveries, bringing the total to 751.

The 473 new pulsars enable diverse studies. Some are millisecond pulsars (MSPs) spinning perfectly smoothly: Nature's most precise clocks, they will likely contribute to measurements of nanohertz gravitational waves from pairs of supermassive black holes in distant galaxies. Others have spindown and binary orbits perturbed by the pulsar's intense plasma wind blasting its stellar companion—these test models of binary evolution. Neutron star mass measurements from such systems constrain the nuclear equation of state. The FAST GPPS survey also finds the slowest pulsars known—near the radio emission “deathline,” they turn on and off, stressing emission models. FAST has now found over one hundred of these Rotating Radio Transients. FAST records single radio pulses from pulsars, but Han et al. also provide detailed measurements of many Fast Radio Bursts.

Most of the 473 discoveries are ‘normal’ pulsars with typical spin periods. With these, GPPS is altering our global view of

the pulsar sky. Many have radio flux densities at 1250 MHz below  $10 \mu\text{Jy}$ , which was a rarity before FAST. Fainter means farther—GPPS probes well beyond the solar circle, long suspected to be atypical in its star formation history. Farther means lower Galactic latitude, for a given height distribution above the Galactic disk, so the new sample probes high background regions, and larger column densities along the line of sight, informing our knowledge of the Milky Way's supernova history and its interstellar medium.

Pulsar discovery is necessary but not sufficient: it is the first step of a long march. Timing—routine repeated observations, to measure the pulsars' spindown and astrometric properties—is essential. Two articles (Wang et al. 2025; Yang et al. 2025) quickly followed this one, with detailed measurements enabled by follow-up timing. Only a quarter of the GPPS survey has been done so far, but timing is also well underway and the harvest promises to get richer and richer.

## References

- Han, J. L., Zhou, D. J., Wang, C., et al. 2025, *RAA*, 25, 014001  
Wang, P. F., Han, J. L., Yang, Z. L., et al. 2025, *RAA*, 25, 014003  
Yang, Z. L., Han, J. L., Wang, T., et al. 2025, *RAA*, 25, 014002

\* This is the News and Views for the FAST Galactic Plane Pulsar Snapshot survey VI by Han et al. (2025, <https://doi.org/10.1088/1674-4527/ada3b7>) in this issue.