

# First release of the largest extragalactic HI catalog

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The promotional image shows the project about the Five-hundred-meter Aperture Spherical radio Telescope (FAST) All Sky HI survey (FASHI). As the image illustrates, the powerful FAST telescope is observing distant galaxies, recording their HI emission, and revealing the detailed physical properties of the galaxies. Credit: Science China Press

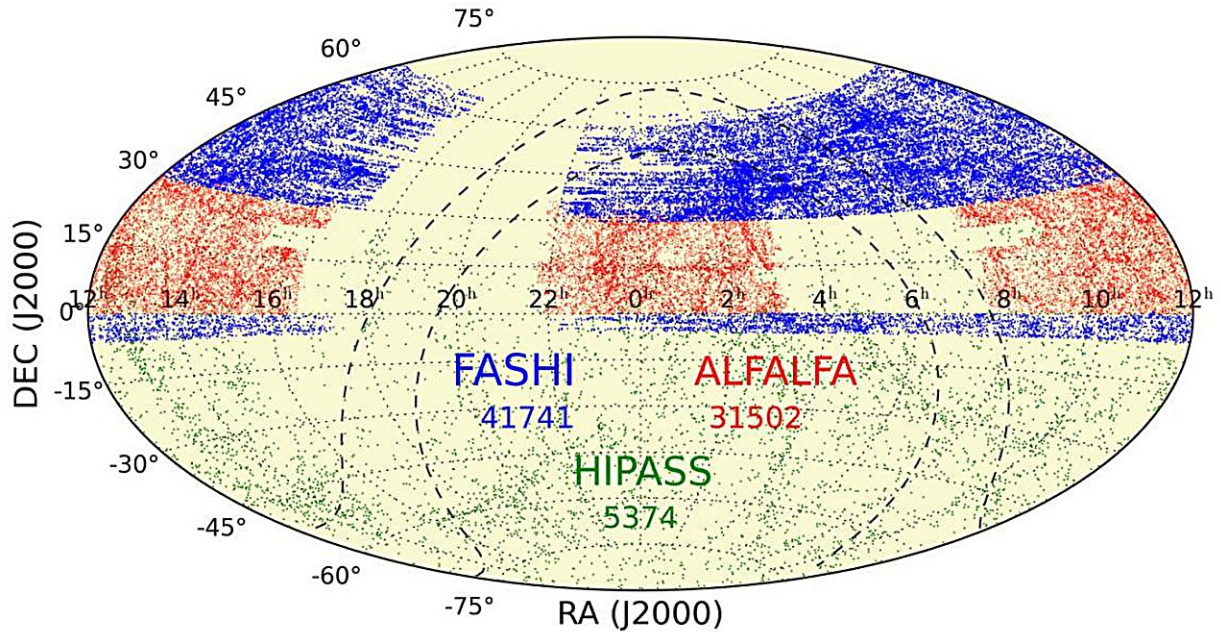
The FAST All Sky HI survey (FASHI) was designed to cover the entire

sky observable by the Five-hundred-meter Aperture Spherical radio Telescope (FAST), spanning approximately 22,000 square degrees of declination between -14 deg and +66 deg, and in the frequency range of 1050–1450 MHz, with the expectation of eventually detecting more than 100,000 HI sources.

Between August 2020 and June 2023, FASHI had covered more than 7,600 square degrees, which is approximately 35% of the total sky observable by FAST. FASHI team has detected a total of 41,741 extragalactic HI sources in the [frequency range](#) 1,305.5–1,419.5 MHz. When completed, FASHI team will provide the largest extragalactic HI catalog and an objective view of HI content and large-scale structure in the local universe.

Lister Staveley-Smith, a professor at the University of Western Australia and a peer reviewer of the paper, says, "That's an impressive milestone. That's is an extremely important contribution to [astronomical research](#), particularly in the field of galaxy evolution."

Hélène Courtois, a professor at the University of Lyon 1, says, "The paper is a fantastic news for projects like Cosmic Flows. I didn't know that the FASHI survey was already going so strongly [for] three years. The quality of the spectra that are shown is exquisite, the completeness of the sample is amazing and showing the excellent sensitivity of the instrument. The area surveyed in just three years gives high hopes that the full sky that can be accessed by the FAST will be covered in a record of time. The paper was a total surprise to me , and reading page after page of the article was just like being a child unwrapping slowly and with delight a Christmas gift."



FASHI sky distribution of the currently released 41,741 HI sources (in blue dots) in the galactic hemispheres, showing the coarseness of the limits imposed by practical and scheduling constraints. For comparison, ALFALFA  $\alpha$ 100 (Haynes et al., 2018) and HIPASS galaxies (Koribalski et al., 2004; Meyer et al., 2004; Wong et al., 2006) are also shown with red and green points, respectively. The two black dashed lines indicate the position of the of the galactic plane at galactic latitude  $b = \pm 10 \text{deg}$ . Credit: Science China Press

The work was recently published in the journal *Science China Physics, Mechanics & Astronomy*. Researchers from Guizhou University, the National Astronomical Observatories under the Chinese Academy of Sciences, and Peking University in China contributed to the study.

**More information:** Chuan-Peng Zhang et al, The FAST all sky H i survey (FASHI): The first release of catalog, *Science China Physics, Mechanics & Astronomy* (2023). [DOI: 10.1007/s11433-023-2219-7](https://doi.org/10.1007/s11433-023-2219-7)

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