

# FAST Proposal Coverage

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## **Project Name:**

HI Narrow Self-Absorption in different carbon chain molecule production regions

## **Project Summary:**

The syntheses of H<sub>2</sub> from HI is critical for formation of molecular cloud and stars. Measurements of [H]/[H<sub>2</sub>] are very important for understanding the physical and chemical states of targeted sources, but difficult in practice. HI narrow self-absorption (HINSA) can serve as a good tracer of atomic hydrogen in molecular clouds, thus providing a probe of [H]/[H<sub>2</sub>]. Existence of ions and atoms is critical to drive CCMs' production, suggesting possible widespread HINSA features in CCM regions. We propose to observe HINSA in 24 sources, 8 in each of the three groups (starless cores, outflows, and PGCCs). FAST observation will facilitate a statistical study of HINSA properties and their relation to CCM production, potentially reveal a chemical evolutionary track.