

A NEW METHODOLOGY FOR THE DETECTION OF LOW-ABUNDANCE SPECIES IN THE ISM:
DETECTION OF INTERSTELLAR CARBODIIMIDE (HNCNH)

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We present the first interstellar detection of carbodiimide (HNCNH) in observations towards Sgr B2(N) using data from the publicly available Green Bank Telescope **PRE**biotic **I**nterstellar **MO**lecular **S**urvey project. Recent laboratory work predicts an abundance of HNCNH of $\sim 10\%$ of the abundance of its tautomer, cyanamide (NH_2CN), or $\sim 2 \times 10^{13} \text{ cm}^{-2}$ in Sgr B2(N). Given this abundance at LTE conditions, the strongest rotational transitions of HNCNH have intensities at or below the noise level of current observations of this source. A thermal population of HNCNH is therefore likely undetectable. Instead, HNCNH is identified via maser emission features at centimeter wavelengths. This detection presents a new methodology for the detection of low-abundance species and further demonstrates the power of cm-wave observations to make definitive identifications based on a small number of observed features.