THE GBT PRIMOS PROGRAM: 7 YEARS OF ASTRONOMICAL DISCOVERY

JOANNA F. CORBY, Department of Astronomy, University of Virginia, Charlottesville, VA, USA; BRETT A. McGuire, Division of Chemistry and Chemical Engineering, California Institute of Technology, Pasadena, CA, USA; MIKE HOLLIS, Astrochemistry, NASA Goddard Space Flight Center, Greenbelt, MD, USA; FRANK J LOVAS, Sensor Science Division, National Institute of Standards and Technology, Gaithersburg, MD, USA; PHILIP JEWELL, ANTHONY REMIJAN, ALMA, National Radio Astronomy Observatory, Charlottesville, VA, USA.

The GBT Prebiotic Interstellar MOlecule Survey (PRIMOS) towards Sgr B2N is the deepest, most complete spectral line survey in the range of 300MHz - 49 GHz. PRIMOS enables astronomers, chemists, and biologists to test theories of molecular formation, the origins of organic chemistry and the molecular complexity and physical and kinematic structure of material in our Galaxy. To date, PRIMOS data have resulted in 14 refereed publications since 2007, demonstrating the power of centimeter wave spectroscopy for detecting new organic species and revealing the significance of non-LTE effects including maser amplification in the cm-wave spectra of organic molecules. The survey has additionally advertised molecular astrophysics in public lectures, summer undergraduate diversity programs, and high school student projects. While the GBT is the only telescope in the world capable of conducting the PRIMOS Survey, PRIMOS data couples with newly available broad-bandwidth telescopes including the Jansky Very Large Array and ALMA. Synergistic observations with ALMA will be necessary to fully characterize the spectra of molecular material and determine excitation mechanisms leading to observed line radiation. This presentation provides an overview of the PRIMOS program, highlights PRIMOS science, and describes how the entire astronomical community can obtain the data for their own research.