

**RESULTS FROM THE LATEST COMMISSIONING RUN
OF A CRYOGENICALLY COOLED PHASED ARRAY
FEED FOR THE GREEN BANK TELESCOPE**

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The Focal L-band Array for the Green Bank Telescope (FLAG) is among the most sensitive phased array feeds (PAFs) under development for any currently constructed, or planned radio telescope. Its unprecedented target sensitivity (T_{sys}/η) of about 35 K, if achieved, will result in a three to five fold increase in spectral line survey speeds. The extraordinary survey capabilities of this cryogenically cooled PAF will enable impressive new science possibilities such as remarkably efficient pulsar search surveys, and the capability to perform a complete census of diffuse neutral hydrogen (HI) around galaxies to answer open questions regarding the role of gas accretion in galaxy evolution and star formation. Data produced from PAFs will be immensely beneficial to supplement future HI surveys planned for future radio telescopes such as the Square Kilometer Array. The wide field of view and low system temperature makes FLAG the ideal instrument in the search for low rate transients like Fast Radio Bursts (FRBs). I will present results from the latest commissioning run of FLAG on the Green Bank Telescope including a map of neutral hydrogen of an extragalactic source, NGC6946, derived from custom data reduction and post correlation beamforming software. In addition to the spectral line science, I will also present initial analysis on observations of a pulsar. These represent the very first map and pulsar data produced from a cryogenically cooled PAF on a large single dish. These results demonstrate the viability of PAFs in terms of next major instrumentation development in the field of radio astrophysics.