Contribution ID: **17** Type: **not specified**

Preliminary Global 21cm Observations with MIST from the Canadian High Arctic

Monday 24 October 2022 14:55 (15 minutes)

The global redshifted 21cm signal emitted by neutral hydrogen at radio frequencies offers novel insights into the birth of the first stars, known as the Cosmic Dawn, which is currently a largely unexplored chapter in our universe's history. The Mapper of the IGM Spin Temperature (MIST) is a multi-institutional collaboration that aims to observe the global 21cm signal from some of the most remote sites on Earth. The MIST instrument corresponds to a single-antenna radio spectrometer and the experiment has been designed to minimize systematic effects from the instrument and the environment. The MIST instrument operates directly above soil with no ground plane, which helps to reduce possible structure in the beam. However, the lack of a ground plane makes the instrument particularly sensitive to the electrical properties of the soil. I will discuss several methods used by MIST to measure the soil electrical properties, which is crucial to minimizing systematic effects. I will then discuss a recent field deployment to the McGill Arctic Research Station (MARS) on Axel Heiberg island in Nunavut, Canada. The MARS site is characterized by minimal radio frequency interference (RFI), making it an optimal site for MIST to detect the 21cm signal with minimal RFI occupation of data. I will then show preliminary measurements taken at MARS, as well as discuss plans for future deployments.

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Session Classification: Extragalactic astrophysics and cosmology