

Title

MeerKAT observations to reveal the nature of SNR G310.6-1.6

Abstract

X-ray Synchrotron supernova remnants (XSSNRs) provide valuable insights into particle acceleration mechanisms. SNR G310.6-1.6, a unique composite XSSNR, is ideal to address this question in Pulsar Wind Nebular (PWN)/SNR systems. Recent ASKAP radio observations revealed a morphology similar to the X-ray counterpart, with a central PWN and a faint SNR shell, suggesting a young age of ~ 2500 years. However, higher frequency observations are needed for accurate spectral and polarimetric structure analysis. MeerKAT's unrivaled high resolution and sensitivity make it perfect for this study. We propose to observe SNR G310.6-1.6 with MeerKAT at L-band (960-1670 MHz) and S-band SPW 2 (2187-3062 MHz) to explore the spectral and polarimetric characteristics of the shell and PWN. With these observations, we will derive the spectral index map, and polarization and rotation measure images, which will improve our understanding of the PWN/SNR system. These observations will also aid in studying other small and faint SNRs, advancing our techniques and knowledge of their evolution.