

Title

A MeerKAT pulsar survey of the Galactic bulge

Abstract

Theoretical considerations and multiwavelength observations strongly motivate the existence of a large population of old millisecond pulsars (MSPs) in the bulge of our Galaxy. This population of MSPs can explain the anomalous emission detected by the Fermi-LAT telescope at GeV energies towards the inner Galaxy. Despite world-wide observational efforts, no final identification of the bulge MSP population exists so far. In order to address this long-standing problem, we propose a pilot project to realise a pulsar survey of the Galactic bulge at the deepest sensitivity ever with MeerKAT, at L- and S-band. The total request for this 4-year project is a total of 87 hours of observations (including overheads): 32 hours at L-band and 55 hours at S-band. These observations will enable us to (1) probe the existence of the MSP bulge population, by discovering more far-distant MSPs; (2) Characterise this population (spatial distribution, luminosity function, total size) and (3) prepare for future time requests moving closer to the Galactic centre. This survey will also be sensitive to young pulsars and other radio transients.