

# Probing the local environments and host galaxy properties of localised Fast Radio Bursts

## Abstract

Fast radio bursts (FRB) are bright, millisecond-duration radio pulses of yet unidentified origin(s) occurring at cosmological distances. While most FRBs are observed as one-off events, 2-3% of the population are repeaters. Optical observations of the well-localised FRBs have resulted in a sample of 24 secure host galaxy associations with redshifts in the range  $z = 0.03 - 1.02$ . Presently, the global host galaxy demographics are diverse. FRBs are seen to arise in starburst to nearly quiescent galaxies and are typically not associated with the nuclei of the hosts. A handful of galaxy images at high spatial resolution show the FRBs to be residing in the spiral arms of galaxies. A sample of nine FRB host galaxies with redshifts below 0.5 asserts a strong correlation between the rotation measures of the host galaxies and the estimated host dispersion measure contributions. We will target 8 well-localised FRBs for one epoch each of 3 hours duration with overheads. We expect to detect radio continuum to be associated with at least half the sample. We will observe 4 FRBs from the sample for an additional 2 epochs of 3 hours each, spaced (i) two weeks and (ii) a month apart from the first epoch to investigate variability. We therefore request a total of 48 hours in this proposal round. Two epochs will allow us to check if the source is variable and a third epoch will enable us to constrain the trend in variability.