

# MeerKAT open time call 3 December - Proposal summary

| High Time Resolution Monitoring of Flares on Proxima Centauri using MeerKAT |   |
|---|---|
| <b>Proposal number</b> 36   | Thu Jan 31 2019 12:32:58 GMT+0200 (SAST)  |
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## Abstract:

We request 16 hours L band observing time using the MeerKAT-64 array to observe our closest galactic neighbour, Proxima Centauri simultaneously with scheduled high time resolution optical observations using the SHOC photometer on the 1.9m telescope at Sutherland. The goal of this campaign is to monitor this active M dwarf for 'white light' flare events in the U band which originate at the stellar surface, and using MeerKAT we will be able to scrutinize any indications of causal, correlated activity at the photosphere to the outer corona where the plasma is expected to become optically thin for GHz radio emission emitted by semi-relativistic electrons originating in the initial flare event. Very limited radio observations of this star have been made to date - using this open call opportunity we would obtain the most sensitive data to date. Despite being limited to Stokes I restricting our ability to definitively discern any coherent emission components, we will characterise flare activity, temporal and flux scales, as well as place the strongest limits yet on the quiescent 'background' coronal radio emission which has remained elusive to date, demonstrating a 'pathfinder' for future observations of this class of stellar object, both for later evolutions of MeerKAT and for the SKA more generally. Taken together this planned optical/radio campaign leverages the great potential for multiwavelength astronomy in South Africa, and would offer new insights into the environment within which the nearest exoplanet in a habitable zone is located.

## Observation parameters:

|                   |   |                           |                       |
|-------------------|---|---------------------------|-----------------------|
| <b>Targets</b>    | Proxima Centauri, 14:29:42.94 -62:40:46.17                                    |                           |                       |
| <b>Total time</b> | 16 in 2 epochs  | <b>Dump rate</b>          | 2 s                   |
| <b>Daytime</b>    | Nighttime required  | <b>Variable/Transient</b> | Variable or Transient |
| <b>Baselines</b>  | We request presence of (6 or more) outer ring antennas in the observing array |                           |                       |

**List of files uploaded.** Files in order of upload. Usually just revising their proposal, so click the last one, but some people attached several different files, so they may all be useful.

<https://drive.google.com/open?id=1Zxr40W9GwFDfS6TUKKJOuyGwBmvVXu66> .

## File comments: