MeerKAT open time call 3 December - Proposal summary

Cross-identifying the brightest radio-sources in the southern sky	
Proposal number 12	Thu Jan 31 2019 04:32:15 GMT+0200 (SAST)
Email address	sarahwhite.astro@gmail.com
Principal Investigator	Sarah White (Rhodes)
Lead technical contact	Ian Heywood (Oxford and Rhodes)
Authors	Kshitij Thorat (Rhodes), Sphesihle Makhathini (Rhodes), Landman Bester (Rhodes), Bernie Fanaroff (SARAO), Athanaseus Ramaila* (Rhodes), Ben Hugo* (Rhodes), Isabella Rammala* (Rhodes), Portia Legodi* (Rhodes).

Abstract:
Low-frequency radio emission allows powerful active galactic nuclei (AGN) to be selected in a way that is unaffected by dust obscuration and orientation of the jet axis. It also reveals past activity (e.g. radio lobes) that may not be evident at higher frequencies. Currently, there are too few “radio-loud” galaxies for robust studies in terms of redshift-evolution and/or environment. Hence our use of new observations from the Murchison Widefield Array (the SKA-Low precursor), over the entire southern-sky, to construct the GLEAM 4-Jy Sample (1,850 sources at S_151MHz > 4 Jy). This sample is dominated by AGN and is 10 times larger than the heavily relied-upon 3CRR sample (173 sources at S_178MHz > 10 Jy) of the northern hemisphere. In order to understand how AGN influence their surroundings and the way galaxies evolve, we need to assemble multi-wavelength data (including crucial redshift information) for these sources. Doing so relies on correctly identifying the galaxy that hosts the radio emission, which can be difficult when the radio emission is very extended, has complex morphology, or is in a region where the spatial density of candidate hosts is high. Following visual inspection (based on existing radio-images of 25-45 arcsec resolution), and thorough checks against the literature, we find that 126 GLEAM 4-Jy sources require either better-resolution or deeper images in order to identify the radio core (and therefore the host galaxy). Hence, we propose using MeerKAT (the SKA-Mid precursor) to follow-up these sources, allowing us to obtain ~6-arcsec resolution images of excellent sensitivity.

Observation parameters:

Targets	The details for the 126 bright sources we propose are appended to the main body of the proposal, as approved by Fernando Camilo. They are also available as a textfile upon request.			
Total time	15.8 in 4 epochs		**Dump rate**	8 s
Daytime	No preference	**Variable/Transient**	No	
Baselines	Our sensitivity calculations allow for 4 of the 64 antennas to drop out, but we require at least 8 of the 9 antennas in the 'outer ring' of the array to be included.			

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=1Tw4d8gvCMGVxyosdNqxnPfCl9jApQvPV .

File comments:
Please note that the Science Case, Technical Case, and Capacity Development Plan are all contained within the first 4 pages of the uploaded document. The target list takes up an additional 2 pages, and was too long to provide via the ‘Target Name(s) and Position(s)’ field above.