MKT-23137

The MeerKAT + South Pole Telescope Survey in z=3-7 protoclusters of galaxies

Abstract

Recent imaging at 888 MHz with ASKAP revealed 2 dex excess radio emission in the core region of 8 of the most spectacular protocluster fields discovered to date from the South Pole Telescope survey (e.g., SPT2349, SPT0348, SPT0457, SPT0303, SPT0553), ranging from z=3-7. While this implies witnessing the brightest cluster galaxy (BCG) build-up associated with radio-loud AGN activity, the current angular resolution and sensitivity is insufficient to pinpoint the radio sources. We propose to obtain deep MeerKAT 3 GHz imaging (at ~3" resolution), along with ULF imaging, to locate and study the sources of radio-emission in these 8 fields, which are only ~4-7sigma detections with ASKAP-RACS. This will allow us to (i) locate the source of the radio-loud AGN in the protocluster cores, and measure the radio spectral index; (ii) build a picture for massive BCG galaxy formation and radio-loud AGN, as radio-loud AGN may be providing strong feedback on a nascent intra-cluster medium, (iii) identify other radio-excess sources in the protoclusters, and even detect the radio emission from the brightest star forming sources (from the radio-FarIR relation).