

CHEXMATE South clusters

Abstract

This proposal aims to complete the coverage of MeerKAT radio observations of the sample of the most massive galaxy clusters of the Universe in the Southern sky. We propose band-L observations for a total of 39 hrs of the 6 dynamically disturbed objects already known to host a radio halo in order to obtain a high sensitivity, uniform coverage of the non-thermal component at GHz frequencies. Coupled with the available X-ray data of the CHEX-MATE project exploring the thermal component, the MeerKAT data will allow to perform the first systematic study of the interplay between the two components by performing a point to point correlation between radio (brightness and spectral index) and X-ray properties (brightness and thermodynamic quantities such as temperature and entropy). The results will put new constraints on particle re-acceleration models and to the formation and evolution of galaxy clusters.