

Title

MeerKAT observations of the most massive CHEX-MATE clusters

Abstract

This proposal aims to extend the MeerKAT coverage of the most massive and perturbed galaxy clusters in the Universe. We propose band-L observations for a total of 60 hrs of 8, yet radio-unknown, clusters drawn from the CHEX-MATE sample which are among the most dynamically disturbed. These data will discover radio halos and relics in new clusters. Coupled with the existing data from the MGCLS and our own observational program, these observations will allow us to perform the first systematic study of the interplay between the non-thermal and thermal components thanks to the MeerKAT and X-ray XMM data. We will investigate point-to-point correlations between radio (brightness and spectral index) and X-ray (brightness and thermodynamic quantities, e.g. entropy) and the results will put novel constraints on particle re-acceleration models and on the formation and evolution of galaxy clusters.