

# MULTIPHASE ISM IN RADIO LOUD EARLY TYPE GALAXIES

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## Abstract

We present optical, IR and X-ray photometric study of a sample of radio loud early type galaxies chosen from B2 sample. To get radial profiles of various photometric and geometrical parameters, We performed multiband surface photometry on CCD images of our sample galaxies in 'BVR' broad band filter and H $\alpha$  narrow band filter obtained from IUCAA Girawali Observatory (IGO 2m telescope) Pune (India) and 2m Himalyan Chandra Telescope (HCT) at IAO (Indian Astronomical Observatory) Hanle, remotely operated from CREST, Hosakote (India), that describe elliptical isophotes fitted to the 2D light distribution of the galaxies. The main focus of our study is to analyze radial profiles of quantities such as the (local) surface brightness, the ellipticity, and the deviations from elliptical isophotes parametrized by the Fourier coefficients. We generated color maps, residual maps, dust extinction maps, H $\alpha$  emission maps and x-ray diffuse maps (obtained from CHANDRA data archive) of the galaxies to study the morphology of the dust, ionized and hot gas content present in the galaxies. We carried out detailed analysis of the dust properties (mass and temperature of the dust) for sample galaxies. We also made use of the HST (WFPC2) archival optical images to investigate properties of the dust in the central region ( $\sim 10$  arcsec) of our sample galaxies, including this we also estimated molecular gas mass, mass loss by red giant stars and mass loss rate from evolved stars in the sample galaxies obtained from IRAS fluxes.

This multiwavelength study of our sample galaxies enabled us to find physical correlation among different phases of ISM also to address various issues related to dust i.e origin, nature and fate (evolution) of dust in radio-loud early type galaxies, coexistence of multiphase ISM in extra-galactic environment and its possible implications for the scenarios of formation and evolution of galaxies.