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Interpreting multiphase gas in cool galaxy cluster cores

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Most baryons in galaxy clusters are in the hot, diffuse plasma known as the intracluster medium (ICM). The radiative cooling times of the central ICM of some clusters are much shorter than their age and yet there are no signs of massive cold gas and high star formation in these cores. The discovery of radio jets/bubbles and X-ray cavities blown by accretion on to the central massive black holes show that the work done in blowing these cavities is comparable to radiative losses. This implies that the radiative losses are roughly compensated by mechanical energy input from jets. I shall describe a simple model based on the interplay of local thermal instability within cores in global thermal balance. I shall also describe numerical simulations of feedback AGN (active galactic nuclei) jets interacting with the ICM and compare them with observations. I shall briefly touch upon the role of magnetic fields and anisotropic transport in the ICM.