

### [XGC-23] Searching for X-ray cavities in various galaxy environments

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In understanding "cooling flow" problem and the galaxy-SMBH co-evolution, AGN feedback is considered as one of the most important phenomena. Among various AGN feedback phenomena, X-ray cavities are particularly useful for studying AGN feedback over 10 kpc scales, as the origin of X-ray cavities is believed to be related to radio jet from AGN. For a comprehensive study of X-ray cavities, we collect all available diffuse X-ray data of galaxies in various galaxy environments, ranging from field galaxies to galaxy clusters, using the Chandra X-ray data archive. As a result we build up a sample of 87 targets showing enough X-ray photons to perform the analysis. Using modeling and unsharp masking techniques, we detected X-ray cavities and measured their physical properties (i.e., cavity size) for the 49 targets. Here, we present X-ray cavity properties and discuss environmental effects.

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### [XGC-24] Progress Report : Research on Detailed Morphology of Cluster Galaxies

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Galaxy morphology is involved complex effects of both secular and non-secular evolution of galaxies. Although it is a final product of a galaxy evolution, it may give a clue for the process that the galaxy suffer. Galaxy clusters are the sites where the most massive galaxies are found, and the most dramatic merger histories are embedded. Morphology study in nearby universe, e.g. Virgo cluster, is well established, but for clusters at  $z \sim 0.1$  it is only focused on bright galaxies due to observational limits. Our optical deep imaging of 14 Abell clusters at  $z = 0.014 - 0.16$  using IMACS f/2 on a Magellan Badde 6.5-m telescope and MegaCam on a 3.8-m CFHT enable to classify detailed morphology. For the galaxies in our data, we investigated their morphology with several criteria related to secular or merger related evolution. Our research on detailed morphology of thousands of galaxies through deep imaging would give a general census of cluster galaxies and help to estimate the evolution of cluster galaxies.