MULTICOLOR PHOTOMETRY
OF X-RAY SELECTED ABELL CLUSTERS

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Strong evidence of evolution in cluster of galaxies at relatively low redshift has been indicated by recent X-ray studies (e.g. Forman W. and Jones C., 1982, *Ann. Rev. Astron. Astrophys.*, **20**, 547 and Edge *et al.*, 1990, *Mon. Not. R. Astron. Soc.*, **245**, 559).

We are conducting a comprehensive optical study of a sample of Abell clusters that are strong X-ray emitters in order to test the X-ray evolution scenarios that have been proposed. The initial observations consist of three-color (B, R, I) imaging of low-redshift ($0.025 < z < 0.25$) Abell clusters using the T2KA CCD on the 0.9m telescope at KPNO the large field ($23' X 23'$, ~ 1 Mpc at $z = 0.025$ and ~ 7 Mpc at $z = 0.25$) gives the unprecedented ability to sample most of the extent of the field of low-redshift clusters using a CCD. Given the advantages of CCDs over photographic plates, we expect to improve on many of the previous studies. A list of X-ray selected cluster of galaxies (Jones C., 1992, *Private Communication*) provides a homogeneous sample of true clusters that cannot be mistaken from apparent over-densities due to projection effects of field galaxies.

Some optical indicators of cluster evolution are the population ratios of

cluster galaxies and their spatial distribution, a regular spiral-poor cluster is expected to be more evolved than an irregular spiral-rich cluster. Also regular spiral-poor clusters present high central concentrations while irregular spiral-rich are less concentrated. Variations in the Luminosity Function (LF) can indicate evolution (Dressler A, 1978, *Astrophys. J.*, **223**, 765). But in order to build reliable LFs is necessary to determine the Hubble types of the cluster galaxies (Binggeli *et al*, 1988, *Ann. Rev. Astron. Astrophys.*, **26**, 631)

In the past the classificactions of cluster galaxies have been done by visual inspection on photographic material, this technique is very limited and can lead to errors when the galaxies are faint. The Hubble types of cluster galaxies can be determined in an objective manner by comparing colors and profiles from surface photometry. To show that this approach is feasible, I have presented preliminary results from the photometric analysis of the Abell-cluster A1213. Colors and profiles of the surface brightness distribution were compared to determined the hubble types of the cluster galaxies.