

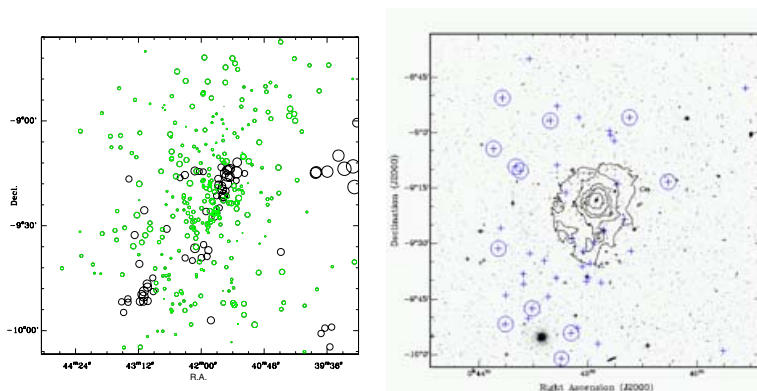
# The Substructure in the Cluster Abell 85

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We revisit the complex structure of the A85-A87 cluster, based on a volume complete VLA-HI imaging survey, as well as optical photometry and spectroscopy. HI imaging studies of a few nearby clusters have shown that most of the HI rich galaxies around clusters are located within infalling groups. The case of A 85 is a very peculiar one, with all the 11 HI-detected galaxies projected east of A 85, and all but one with much lower radial velocities ( $\sim 15,000 \text{ km s}^{-1}$ ) than the cluster's systemic velocity ( $16,500 \text{ km s}^{-1}$ ). In order to quantify the degree of substructure in A 85 we estimate the parameter  $\delta$  defined by Dressler and Schectman, and plot it in Fig. 1a: many large circles in the same area indicate a great possibility of substructuring (Bravo-Alfaro *et al.* 2007 in prep).

Using several photometric and spectral catalogues we constitute the sample of late-type, HI-deficient galaxies (Fig. 1b). We focus on the substructure drawn in Fig. 1a, some 35' SE of A 85, coincident in projection with Abell 87. We found an interesting evolutionary sequence as a function of the projected distance to A 85: First, at an average distance of 40' (2.5 Mpc) from the cluster center, we find the HI richest and bluest galaxies, with strong emission features. Moving closer to the ICM edge ( $\sim 30'$  or 1.9 Mpc), we find galaxies with redder colors, but still some H $\alpha$  in emission. Finally, onto the first contour of the X-ray emission seen by XMM-Newton (Fig. 1b), all galaxies show typical colors of early spirals and display no emission lines at all (distance  $\leq 1.5$  Mpc). This kind of infalling groups of galaxies, for which most of the evolution (morphology, gas content, and SF activity) of their members seems to be linked to the whole cluster environment, would be the counterpart of those groups with strong preprocessing suffered well before the close contact with a major structure.



**Figure 1.** Fig. 1.a (left panel) Distribution of galaxies in Abell 85 (with measured redshifts) each marked by a circle with size proportional to  $\delta$  (see text). Fig. 1.b (right panel) Positions of late-type galaxies brighter than  $M_B = 18.0$  (crosses); the HI-detected ones are indicated with circles. Contours indicate the ICM drawn by the X-ray.