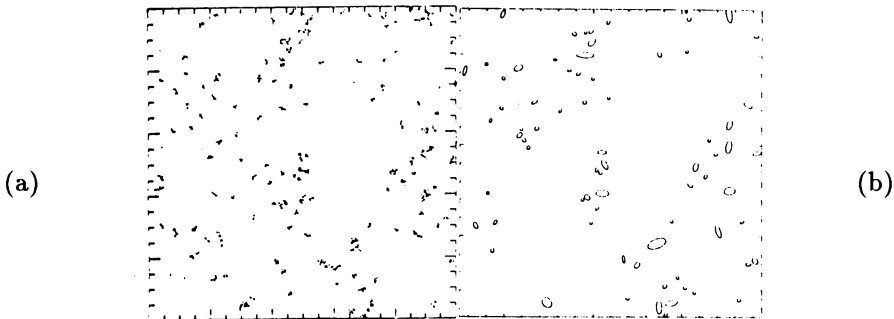


## GALAXY CLUSTERS IN THE APM SURVEY

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We have completed a deep wide-field galaxy survey (the APM survey) using the Automatic Plate Measuring machine in Cambridge. The APM survey covers 4400 square degrees in the Southern hemisphere and is designed to be complete to a magnitude limit of  $b_J = 20.5$ . A more detailed description may be found elsewhere in these proceedings. We are using this survey to generate a new catalogue of galaxy clusters similar to that of Abell (Abell, G.O., 1958, *Astrophys. J. Suppl.*, **3**, 211.). Our cluster catalogue will represent a significant improvement over previous work, since we have detailed information on each individual galaxy including position, size profile and magnitude.

So far we have used two simple methods to create automatically defined cluster catalogues. The first locates clusters by calculating the galaxy surface density in a grid of cells, and then finding connected areas of high surface density. The second uses a percolation algorithm, which defines a cluster by including all galaxies which are within a certain distance from any other cluster member. Figure 1 shows the clusters located by these two methods for a typical APM field. Cluster properties such as the eccentricity, orientation, size, and richness can be measured with some accuracy. In collaboration with O.Lahav we are applying maximum entropy methods to determine cluster distances from the magnitude and angular diameter distributions.



**Figure 1.** Galaxies in clusters on UKSTU field 287. (a) shows the positions of galaxies in the clusters defined by the percolation algorithm described in the text. (b) shows ellipses with sizes, eccentricities and orientations calculated from the galaxy surface density map.