

DISCUSSION

Huchra: Can you estimate a magnitude limit for the completeness of the Markarian Surveys?

Urbanik: We estimate the limiting magnitude for completeness in region II to be about 14^m or even worse, and about 15^m in region I.

Heidmann: Cannot these limiting magnitudes for completeness be simply obtained from the log (number) versus magnitude counts?

Urbanik: The limiting magnitude for completeness can, of course, be obtained from such counts. We did not make counts, because we were not specially interested in a knowledge of limiting magnitude for each region individually. We were interested in the mutual relations between changes of the tendency toward clustering, average surface density and the slope of the mean number-magnitude counts.

SUPERCLUSTERING OF GALAXIES

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A new type of catalogue of extragalactic objects is nearing completion in our department. The catalogue is on magnetic tape and is a compilation of data for galaxies and cluster of galaxies, together with references, and for counts of galaxies. At present this Metacatalogue contains about 3×10^5 entries - Abell and Zwicky clusters, Zwicky galaxies, Lick counts, Jagellonian counts and some others. The first two files of the catalogue can be obtained on request from the Centre de Données Stellaires at Strasbourg.

The Metacatalogue enables us to investigate the large scale distribution of galaxies. A process for searching for second-order clusters of galaxies has been developed. The process consists of smoothing and filtering two-dimensional discrete fields, defined on a lattice, the trend being attenuated beforehand. The process is described by Kalinkov, M. (1974, *Proc. First Europ. Astron. Meet.*, 3, 142; 1975, *Mem. Soc. Astron. Ital.*, 45, 639; 1977, *Highlights of Astronomy*, 4, part I, 279), by Kalinkov, M., Stavrev, K., Kaneva, I., Dermendjiev, V. (1976, in *Stars and Galaxies from Observational Point of View*, Tbilisi, 309) and by Kalinkov, M., Kaneva, I., Stavrev, K., Tomov, B., Vlahova, K., and Yanev, K. (1976, *C. R. Acad. Bulg. Sci.*, 29, 453).

Some examples of the latest (1977) results are given in Figures 1-3.

Figure 1 shows a medium scale filtering for all Zwicky clusters (northern galactic hemisphere). The North Galactic Pole is at the centre and the point of view is $\varrho = 315^\circ$. At least 60% of all condensations are real second-order clusters with characteristic sizes of

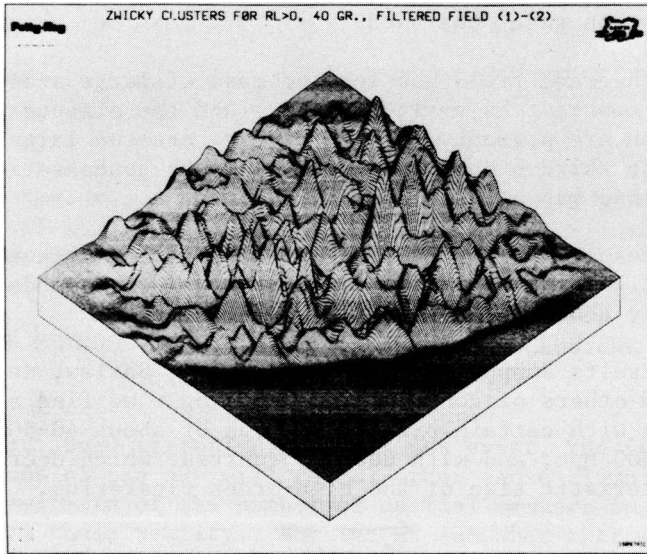


Figure 1

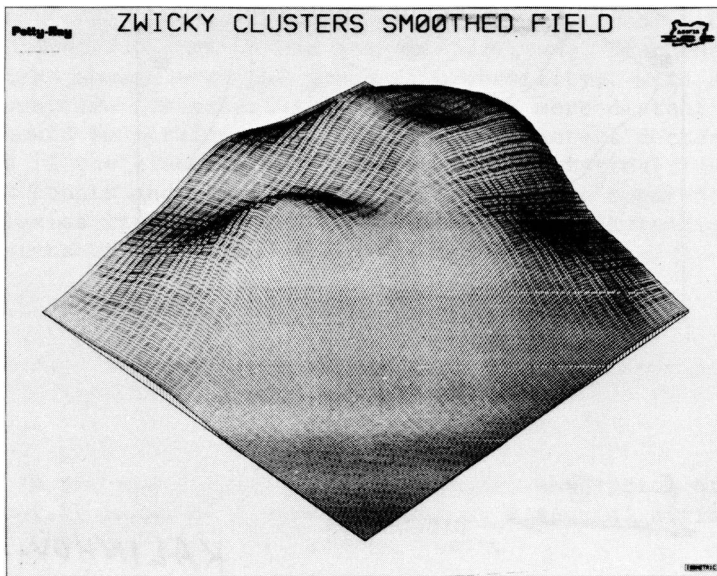


Figure 2

40-50 h^{-1} Mpc. The density contrast is between 2 and 4 for the particular filtering function which was used.

Figure 2 is the same field but for the case of large scale smoothing. The density contrast is smaller (1.5-2) and the effects of galactic extinction are present. However, there are two large condensations, which may be third-order clusters. The same condensations may be found on the smoothed map of Abell clusters.

Figure 3 represents a large scale smoothing of the Lick reduced counts of galaxies. Only one of the condensations corresponds roughly to Abell and Zwicky condensations.

Our recent results support the ideas of Kiang, Saslaw, de Vaucouleurs, Peebles and others of continuous clustering - we find a tendency towards clustering with certain preferred sizes of about 40-50, 90, 120-150, 200 and 300 Mpc, and with density contrast which decreases with increasing characteristic size of the high-order clustering.

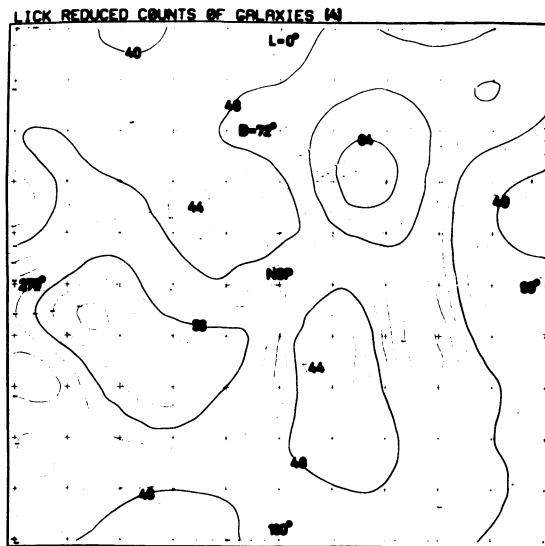


Figure 3

DISCUSSION

de Vaucouleurs: Did you make similar plots for the old Hubble counts? If so, how do they correlate with Lick, Abell and Zwicky clusters counts?

Kalinkov: Yes, we have now some maps for the old Hubble counts. They are similar to the maps for Lick counts but not to Zwicky cluster maps.

Tammann: Do you find the same superclusters from two or more catalogues? If so are the observed identities above those expected from chance coincidences?

Kalinkov: Yes, there are at least 20 second-order cluster coincidences between Abell and Zwicky catalogues. The expected number of chance coincidences is 2 or 3.

ON THE METHODS OF DISCOVERING GROUPS AND CLUSTERS OF GALAXIES

B. I. Fessenko

Groups. Even if real groups did not exist, the investigation of large regions of the sky will reveal other dense clumpings of galaxies. The usual estimate of the number of optical members in these clumpings will confirm their reality. But let us remember that all these groups are false. False groupings of galaxies should emerge in large numbers because of the effects of interstellar absorption and of variability of the observing conditions. Statistical considerations of the groups detected by Turner and Gott (1976, *Ap. J., Suppl. Ser.*, 32, 409) leads to the conclusion that the percentage of false groups members is equal to 40% or more.

Clusters. Here the same remarks apply. At a given apparent limiting magnitude the distribution of galaxies (or real groups) as a function of distance from us has a single maximum. Near that maximum false clusters emerge with the greatest probability. With a larger limiting magnitude for galaxies in the sample, more distant false clusters should be obtained. Their angular diameters decrease in the same way as if the clusters were real ones. Statistical investigations of the Lick counts and other sources of data on the apparent distribution of galaxies lead me to the conclusion that a substantial fraction of the clusters of Zwicky and Abell are false clusters.

DISCUSSION

de Vaucouleurs: We do not understand how you could separate out the galactic extinction variance by restricting your study to $b > 60^\circ$ (i.e. $\text{cosec } b \approx 1$).

Fessenko: In the analysis of the Lick counts, absorption of light was estimated not by means of a cosec law but by a special differential method of processing unreduced galaxy counts.

Bolton: Is the absorption you are considering colour dependent or non-selective?