

THE SPATIAL DISTRIBUTION OF SEYFERT GALAXIES

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For some years, this author has suspected that certain small regions of the southern sky were "good fishing grounds" for finding Seyfert galaxies. It is now possible to follow up this suspicion, not only on the sky (see also Fairall 1979, Petrosian and Turatto 1986) but in three-dimensional space (with redshift assumed to indicate distance). Figure 1 (overleaf) is a sample of the plots obtained from a database of some 6200 galaxies, south of Declination -17.5° for which redshifts are available - including 199 Seyfert galaxies (Fairall and Jones 1988). The data is not ideal, since it lacks statistical control; but experience has shown it nevertheless to be reliable for galaxies in general, whilst it is hoped that few, if any, higher-luminosity Seyfert nuclei remain undetected.

Seyfert galaxies, being mainly spirals, obviously avoid dense clusters (as found in the Hydra I and Centaurus clusters - plots not included here). Outside of such concentrations, the distribution of Seyfert and narrow-emission line galaxies is like that of galaxies in general, showing voids and foamlike structures - see Figure 1. There is no tendency for emission-line galaxies to fill in voids (cf Balzano and Weedman 1982 - except the so called "Bootes" void is probably not a single void). However, the relative proportion of Seyfert and other emission-line galaxies to galaxies in general shows variation. Regions marked "E" in the accompanying plot show an excess of Seyfert/emission-line galaxies - the most conspicuous by far being centred at R.A. 23^h , Decl. -35° , $cz = 1500 \text{ km s}^{-1}$. Regions marked "D" in the plot have an apparent deficit of Seyfert/emission-line galaxies as compared to other galaxies. This would suggest that certain void walls or knots in the foamlike structure are gas-rich, while others are gas-poor, and the gas-rich environment feeds the Seyfert activity.

On a much larger scale, it is noted that very few Seyferts have yet been found in the region R.A. 20^h to 0^h , Decl. -20° to -45° , $cz \geq 7000 \text{ km s}^{-1}$.

References

Fairall, A.P., 1979. *Mon. Not. Astr. Soc. Sthn. Africa*, 38, 68.

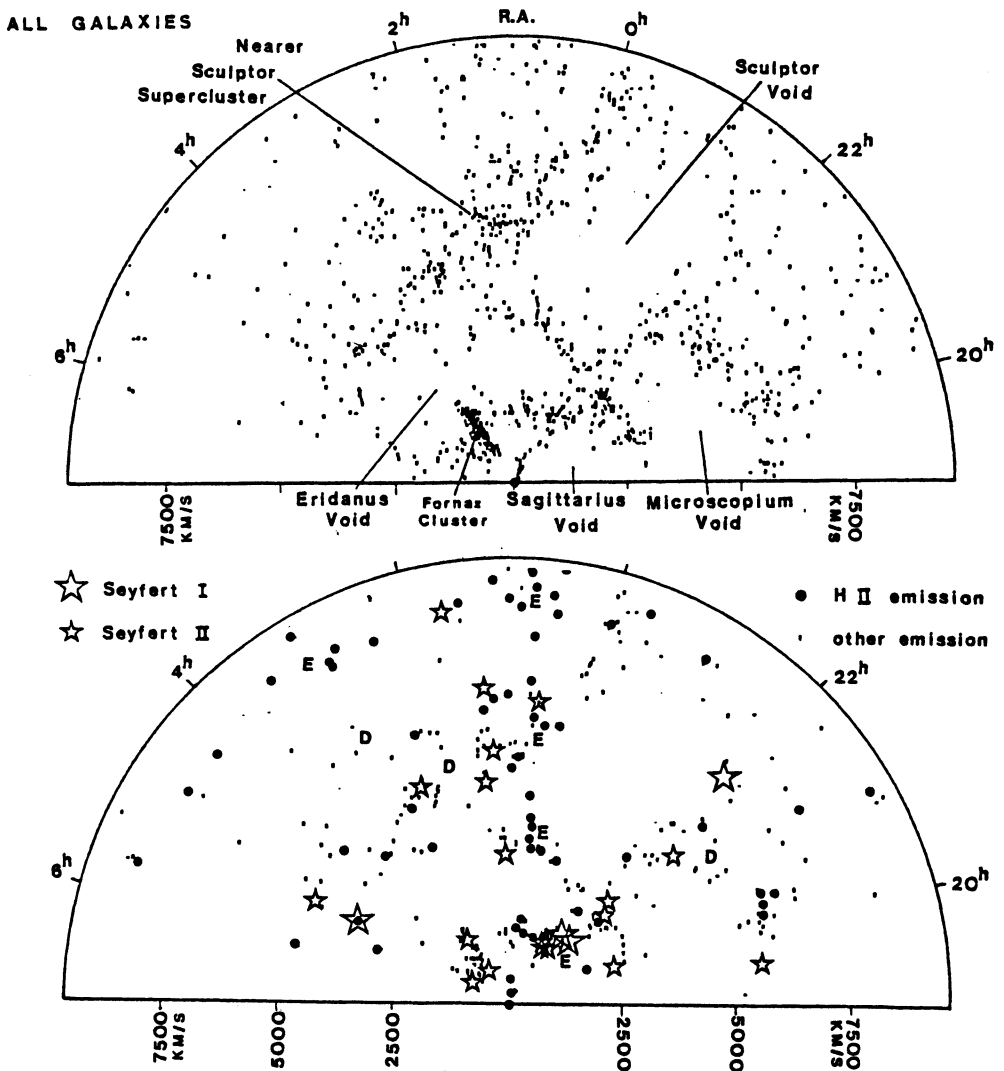


Figure 1 The Distribution of Seyfert/emission line galaxies, compared to that for all galaxies, in the Declination slice -17.5° to -47.5° . (E = Excess - D = Deficit - see text)

Fairall, A.P. and Jones, A., 1988. "Southern Redshifts - Catalogue and Plots" (Publ. Dept. Astr. Univ. Cape Town, No. 10).

Petrosian A.P. and Turatto, M., 1986. *Astron. and Astrophys. Suppl. Ser.*, 65, 349.

Balzano, V.A. and Weedman, D.W., 1982. *Astrophys. J.*, 225, L1.