

THE PISCES-CETUS SUPERCLUSTER COMPLEX

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It has been proposed in two recent articles by this author (Tully 1986, 1987) that rich clusters of galaxies tend to congregate in complexes involving of order 50 clusters over regions roughly $300 h_{75}^{-1}$ Mpc across. The particular complex that we reside in has the additional remarkable property that the clusters are concentrated in a plane that is coincident with the plane described by the distribution of nearby galaxies. The extraordinary coincidence between the plane defined by rich clusters at a characteristic velocity of $15,000 \text{ km s}^{-1}$ and the plane defined by galaxies at a characteristic velocity of 1500 km s^{-1} suggests a causal connection.

The following five pieces of evidence are given in favor of the reality of this large-scale structure. The first three items are particularly difficult to dismiss.

1. A one-dimensional correlation analysis of Abell clusters within $0.1c$ reveals that the slope of the correlation function is steeper along a vector perpendicular to the plane of the Local Supercluster than along other vector directions (3σ significance).
2. Southern pole cap clusters defined by Shectman that lie at a characteristic redshift of $15,000 \text{ km s}^{-1}$ are concentrated toward the supergalactic equator ($\sim 6 \sigma$ signal with FWHM $\sim 25 h_{75}^{-1}$ Mpc).
3. Two-thirds of Abell clusters within $0.1c$ can be assigned to one of five supercluster complexes. These complexes can be characterized by extremely high core overdensities and low filling factors ($\Delta\rho/\rho \sim 25$; core volumes occupy 0.5% of volume available).
4. A percolation analysis with the Abell cluster sample reveals that percolation across the dimensions of the sample occurs with a low value of the percolation scalelength (percolation scalelength/mean density scalelength = $38 h_{75}^{-1}$ Mpc/ $54 h_{75}^{-1}$ Mpc).
5. There is a significant concentration of Abell clusters within $0.1c$ to the supergalactic equator (3σ signal with FWHM $\sim 40 h_{75}^{-1}$ Mpc).

REFERENCES

- Tully, R. B., 1986. *Astroph. J.*, **303**, 25.
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