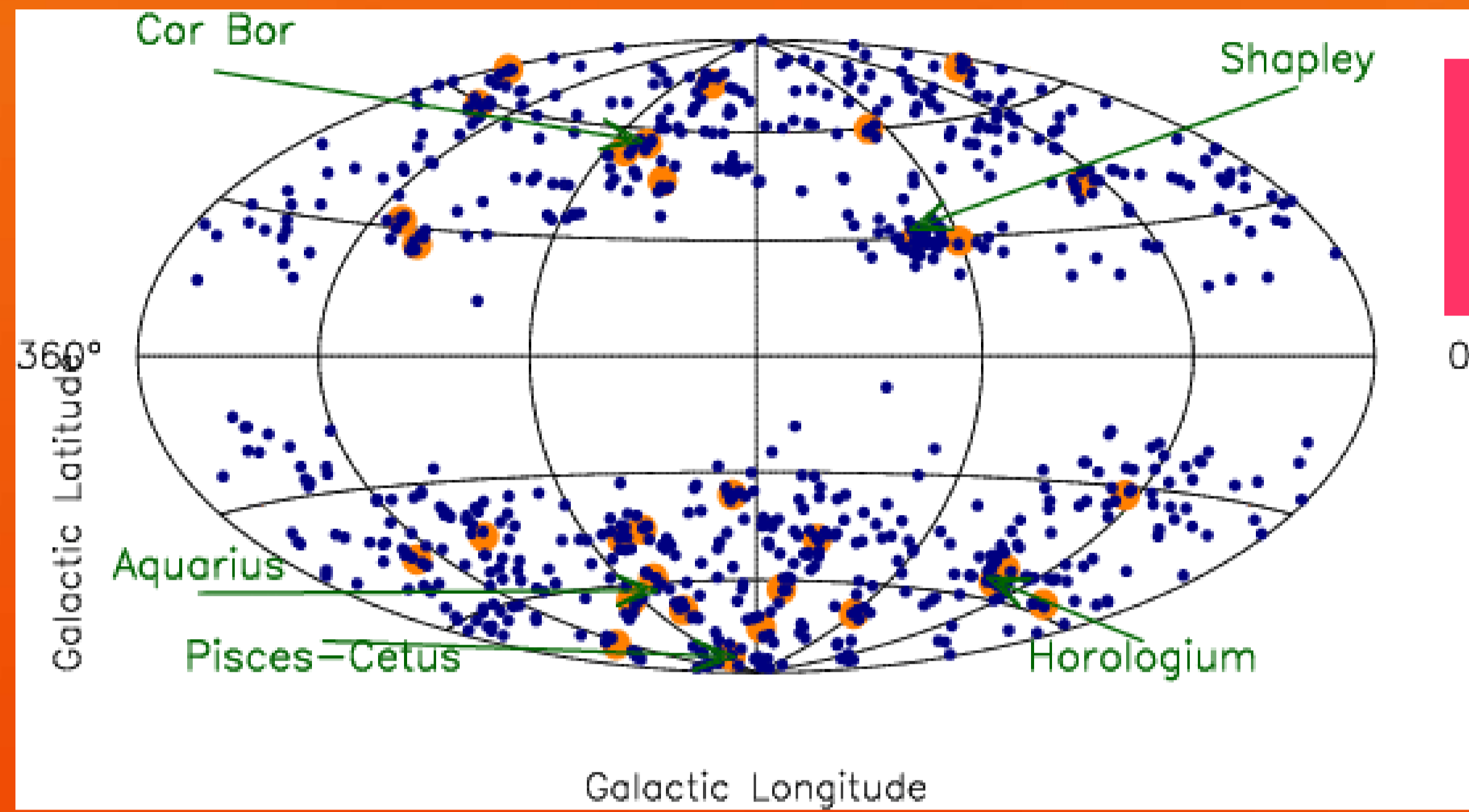


STAR FORMATION IN THE PISCES-CETUS SUPERCLUSTER

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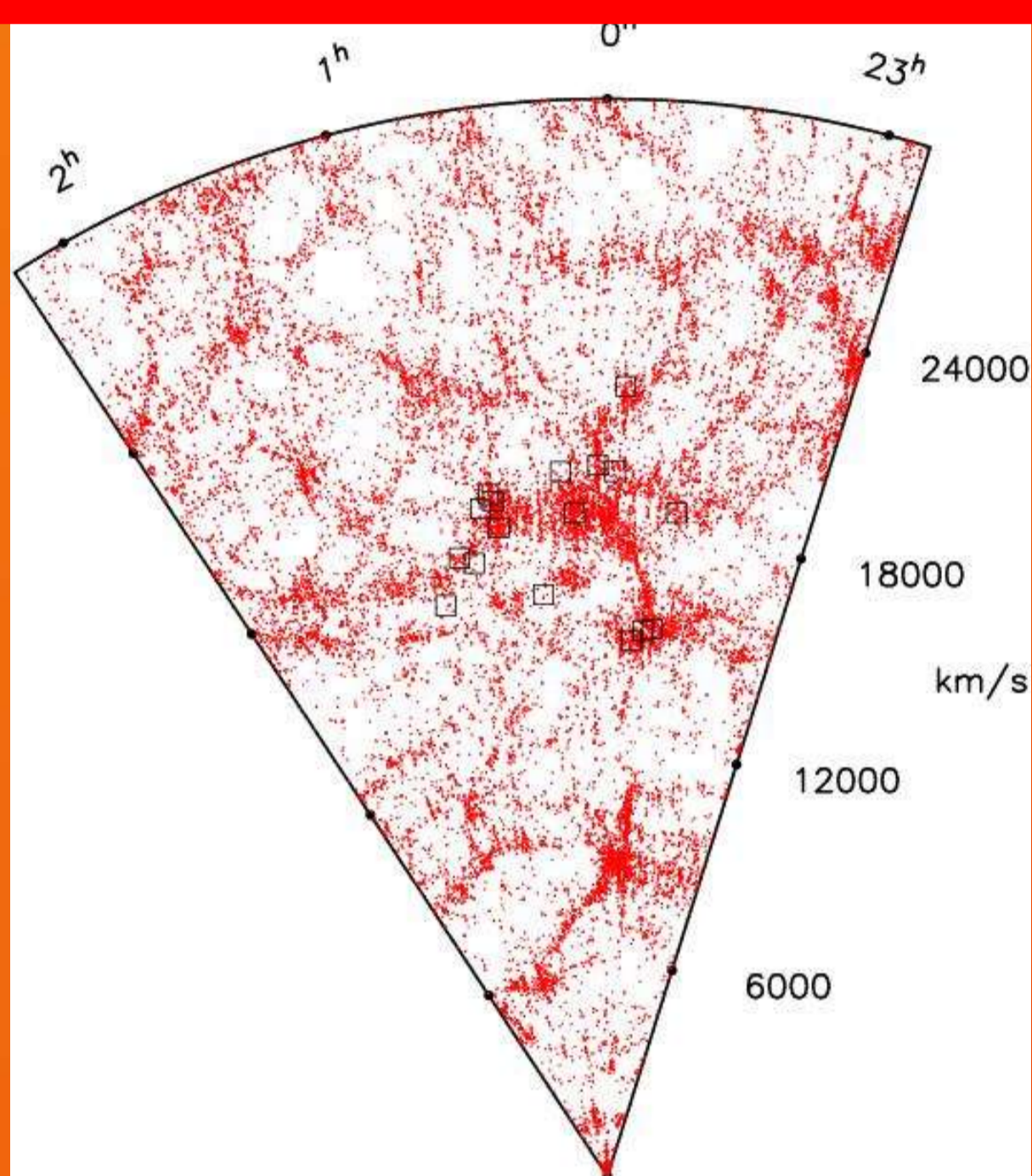
Studies of the environmental effects on galaxy evolution have shown that star formation is suppressed in the cores of rich clusters. Here we investigate the effect by selecting a sample of galaxies that belong to groups and clusters belonging to the part of Pisces-Cetus supercluster in the 2dFGRS volume, and compare their properties with those of galaxies elsewhere. We find that star formation is enhanced in group galaxies in the Supercluster, and suppressed in cluster galaxies.

Galaxies with redshifts (from 2dFGRS and ZCAT) in the Pisces-Cetus Supercluster region ($-20^\circ < \text{Declination} < -32^\circ$). The mean positions of the clusters in the supercluster are marked. Note that the 2dFGRS only covers the region $-32^\circ < \text{Dec} < -25^\circ$.

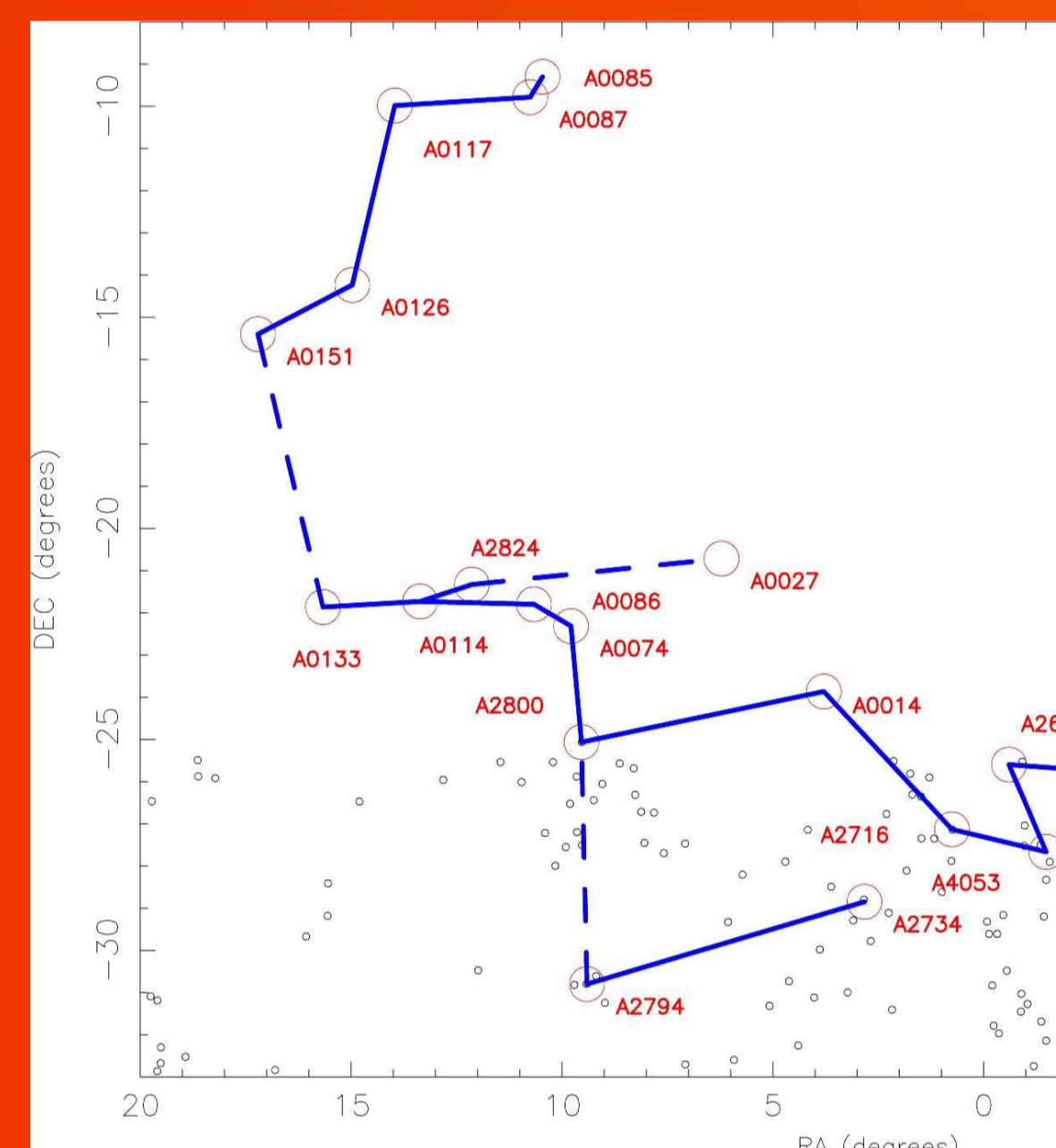


Superclusters from Raychaudhury et al. (2005) found using a minimum spanning tree analysis of a complete redshift survey of $z < 0.1$ Abell clusters

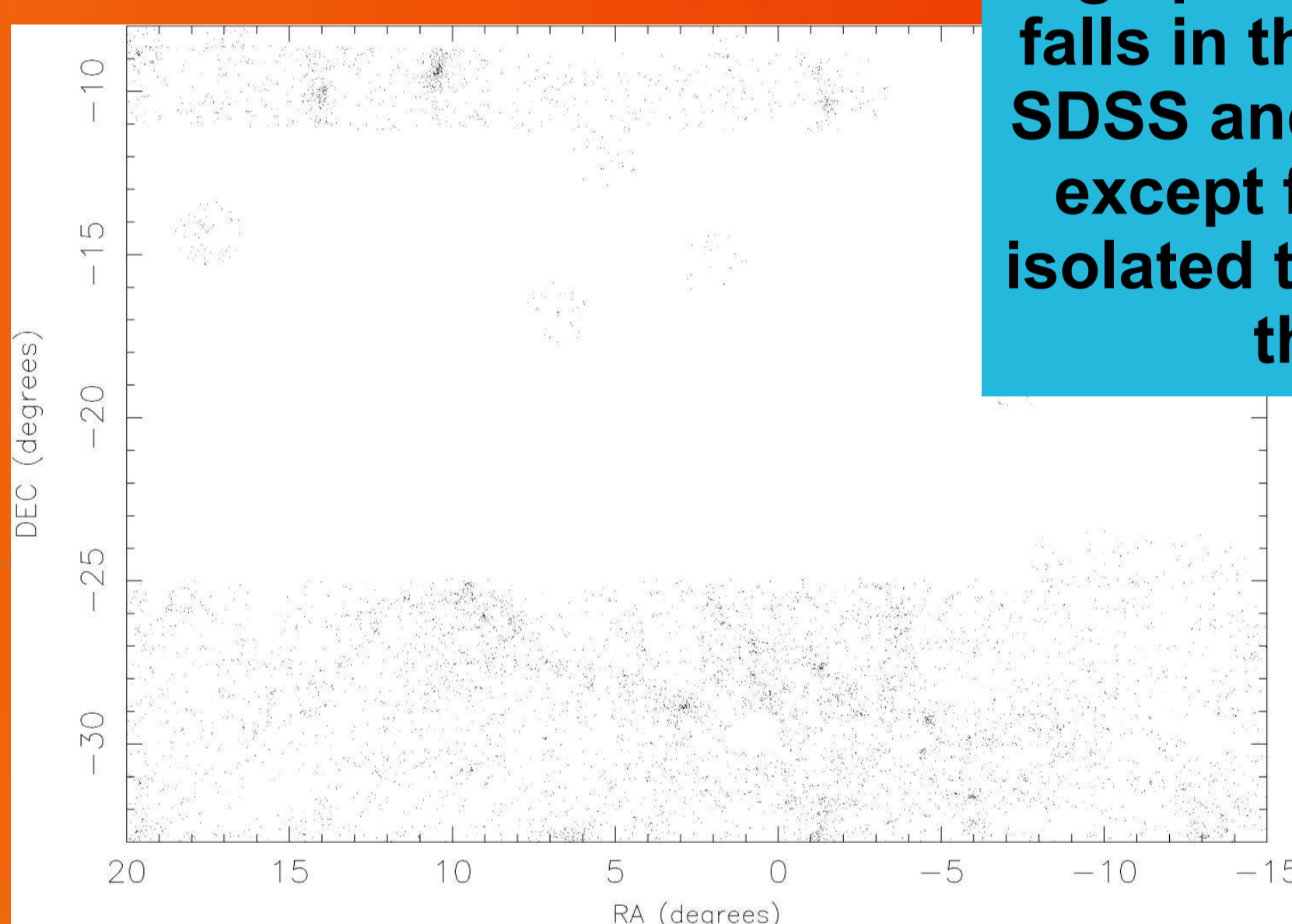
Clusters of galaxies belonging to the Pisces-Cetus Supercluster. The minimal spanning tree used to identify the Supercluster is shown connecting the clusters. Edges in the tree with length 20 Mpc are shown as solid lines and 25 Mpc links as dashed lines. Groups of galaxies with 4 or more members and with redshifts between 12000 and 23000 km s^{-1} (2PIGG, Eke et al 2004) identified from a friends-of-friends analysis of the 2dFGRS are shown as little circles



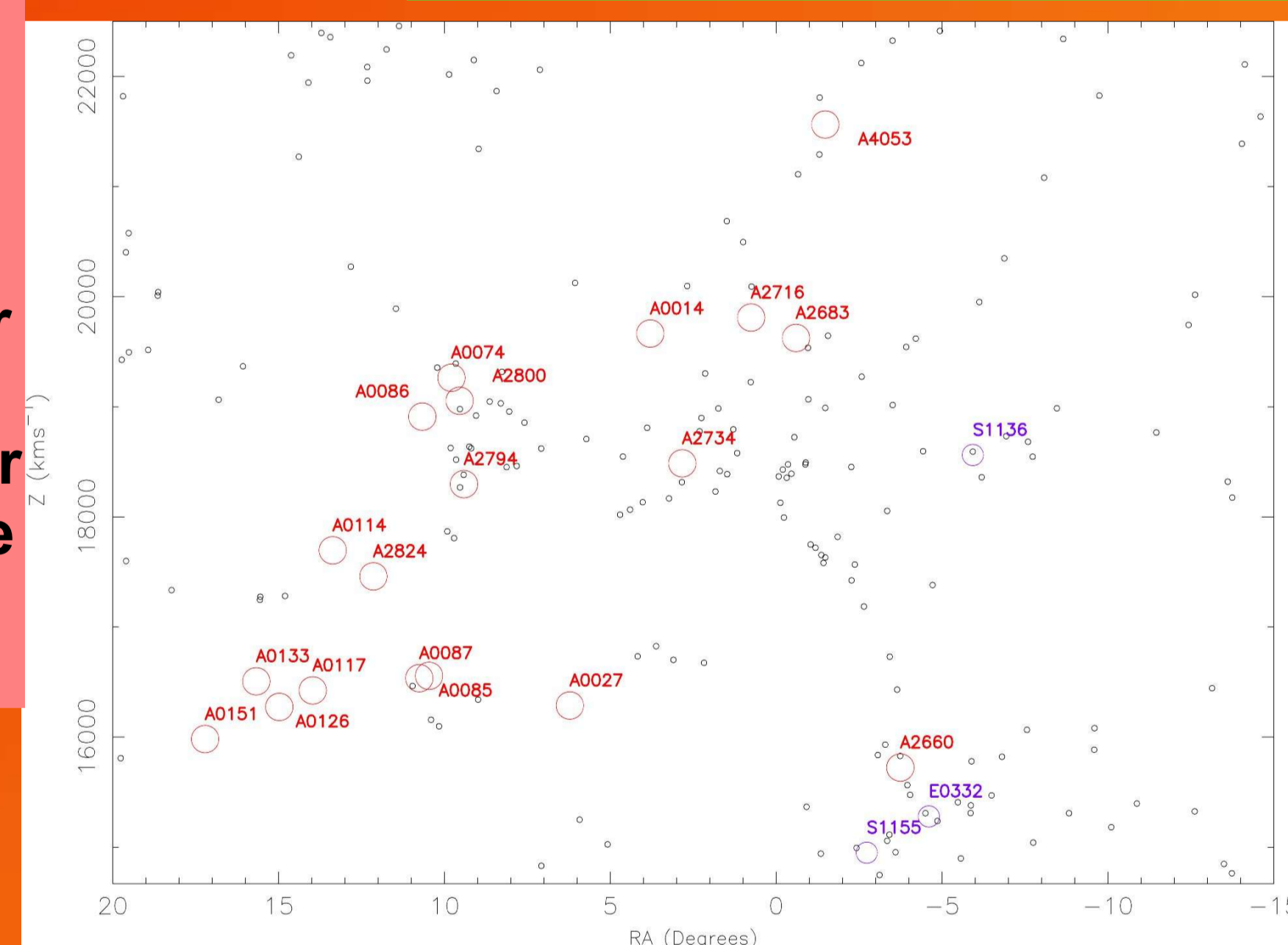
All galaxies with measured redshifts from the 2dFGRS and SDSS surveys in the region, between redshifts of 13920 and 22590 km s^{-1} . A large part of the supercluster falls in the gap between the SDSS and 2dFGRS surveys, except for the occasional isolated two-degree fields of the 2dFGRS.



Minimum mass of the supercluster taking the virial mass of just the clusters is found to be 1.32×10^{16} solar masses. With $\Omega = 1.9$ over a volume of $13000 h_{70}^{-3} \text{ Mpc}^3$ and $\Omega = 1.2$ over a volume of $35000 h_{70}^{-3} \text{ Mpc}^3$ for the upper and lower chains respectively.

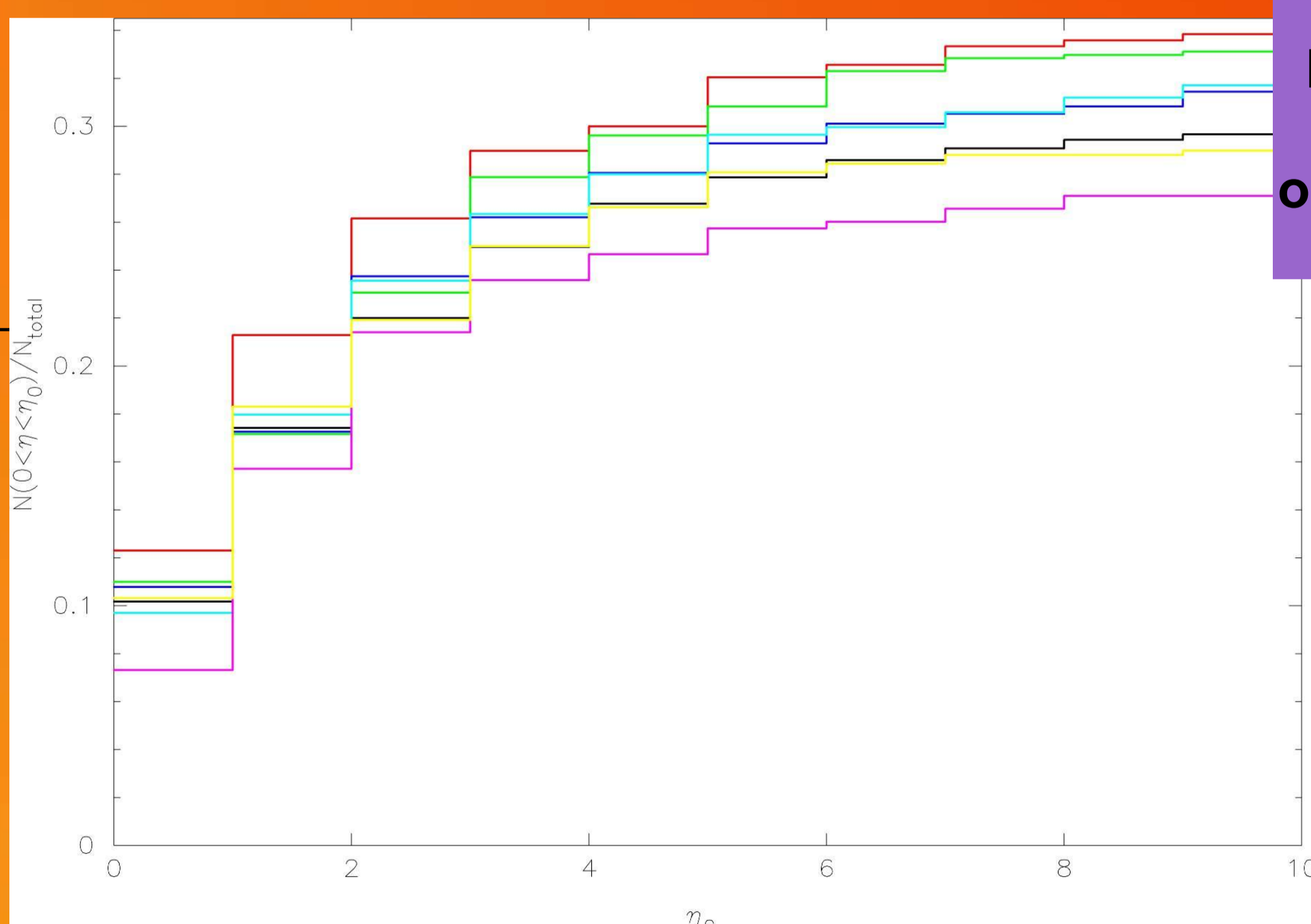


Clusters of galaxies belonging to Pisces-Cetus Supercluster, with Right Ascension plotted against redshift. This plot shows that the A151 end is nearer to us than the A4053 end. Groups of galaxies with 4 or more members (2PIGG, Eke et al 2004) are shown as little circles.

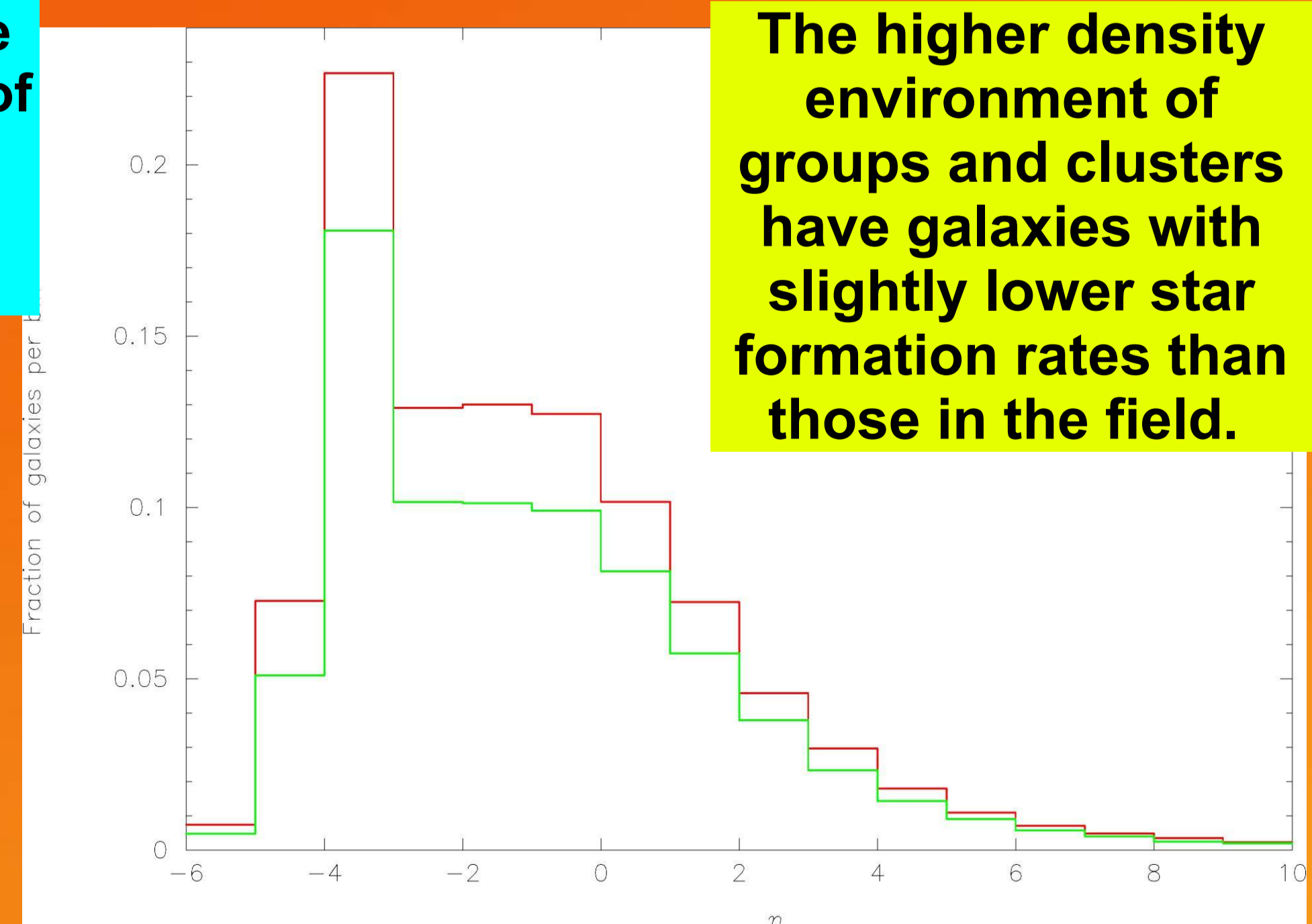


Group galaxies within the supercluster are seen to have higher star formation rates than group galaxies outside the supercluster or in the field

Histogram of The 2dFGRS spectral parameter η for field galaxies and for galaxies that are members of a group or cluster of at least 4 members. η is directly proportional to the width of the H_α emission line. Hence higher values of η imply higher star formation rates. (Red = Field Galaxies, Green = Group or Cluster Galaxies).



The higher density environment of groups and clusters have galaxies with slightly lower star formation rates than those in the field.



Cumulation distribution of the fraction of galaxies with a certain η parameter (which shows enhanced star formation), plotted only for the galaxies that have $\eta > 0$ (Black = field sample, Magenta = cluster galaxies within the supercluster region, Yellow = cluster galaxies not within the supercluster region, Red = poor group galaxies within the supercluster, Green = rich group galaxies within the supercluster, Blue = poor group galaxies not within the supercluster, Cyan = rich group galaxies not within the supercluster.)