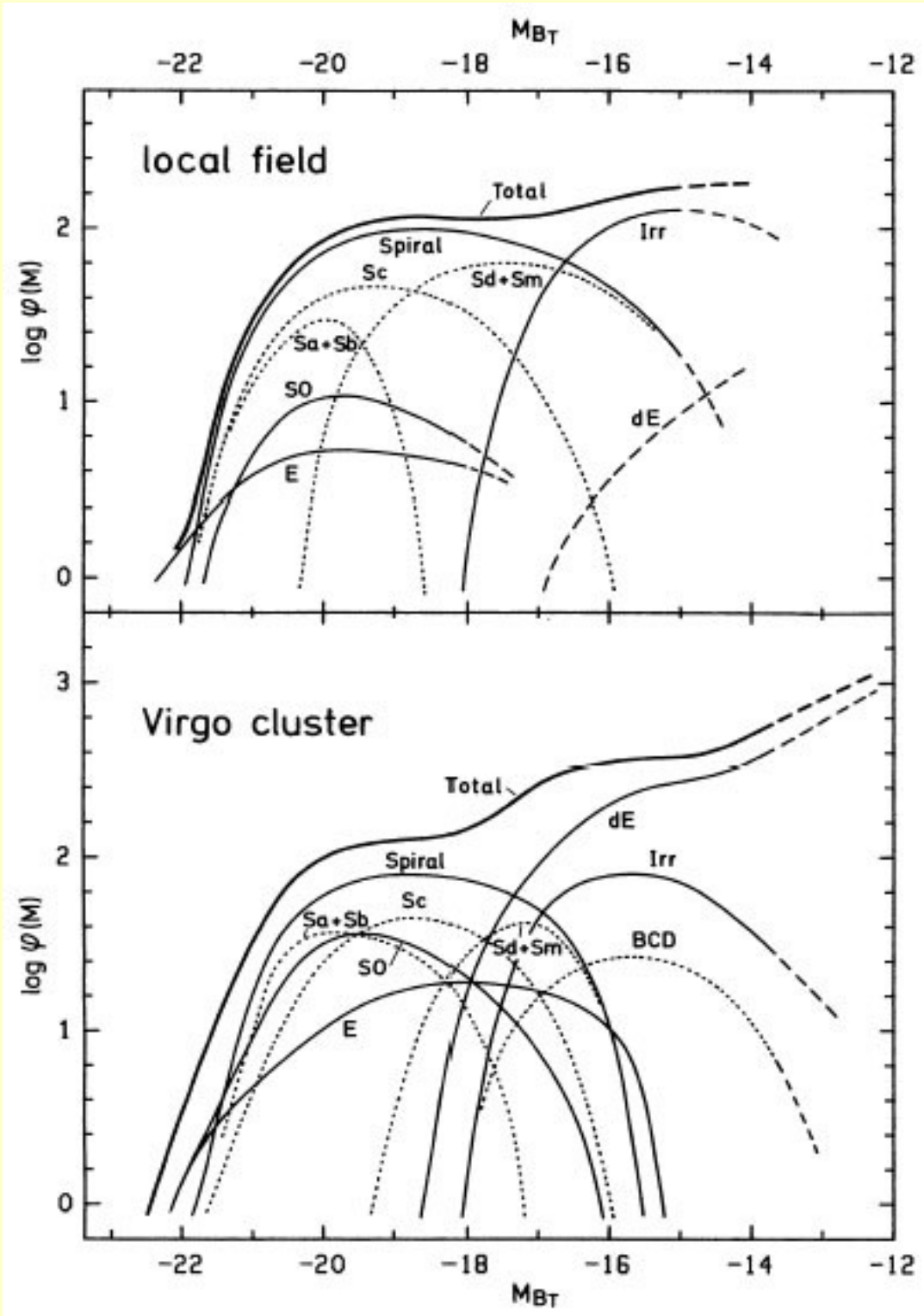
Field and clusters
differ for their morphological
Content as shown by their
LF (Many more Ellipticals
in clusters!)



Kraan-Korteweg & Tamman 1979

Kraan-Korteweg & Binggeli 1987

Early galaxies populate more clusters than field and more central/dense regions than external regions.

Morphology density relation

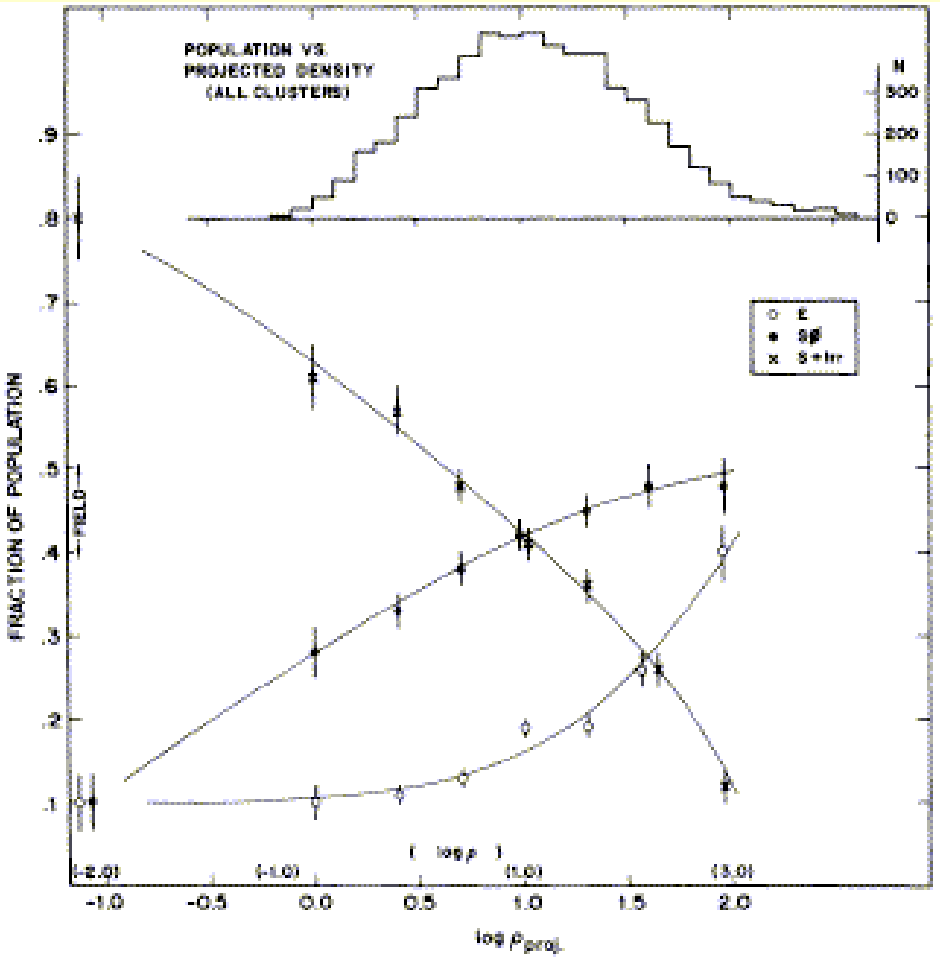


FIG. 4.—The fraction of E, S0, and S+I galaxies as a function of the log of the projected density, in galaxies Mpc^{-2}. The data shown are for all cluster galaxies in the sample and for the field. Also shown is an estimated scale of true space density in galaxies Mpc^{-3}. The upper histogram shows the number distribution of the galaxies over the bins of projected density.

Dressler 1980 ApJ 236, 351

Morphology density relation

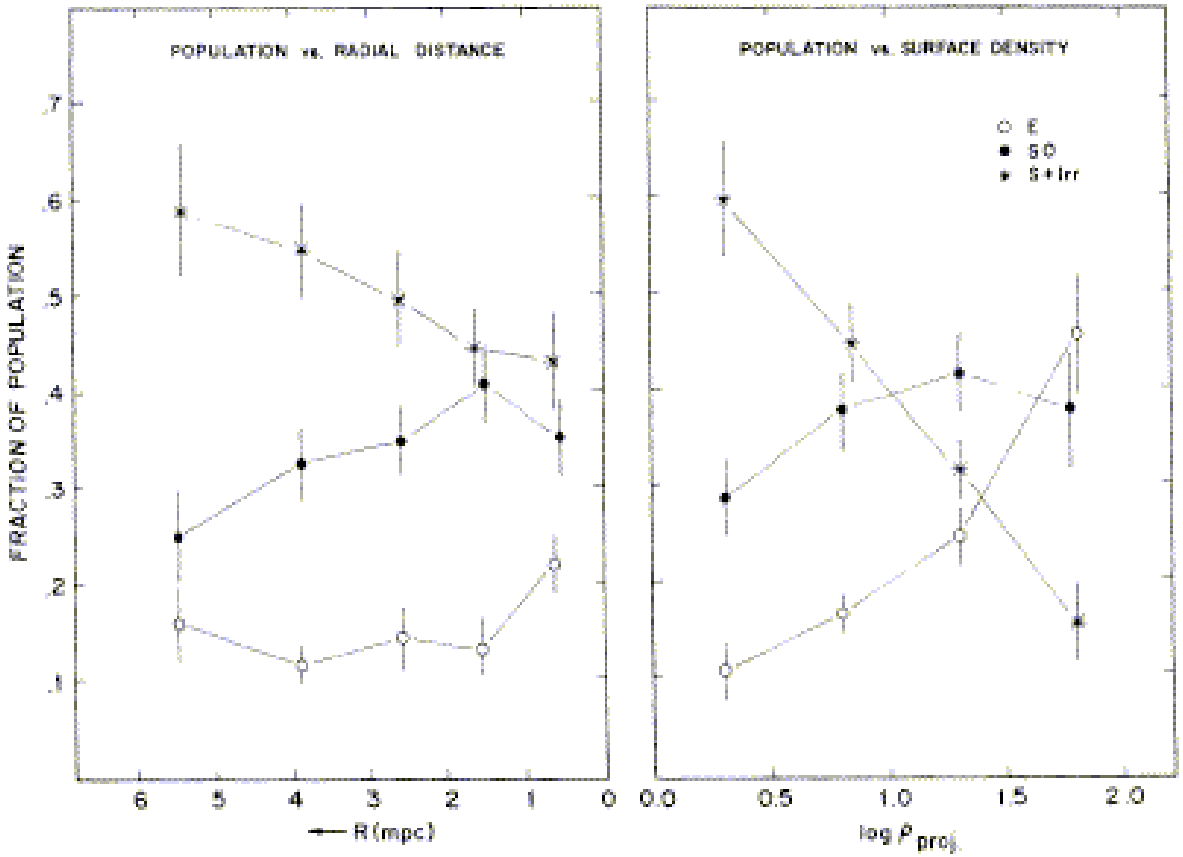
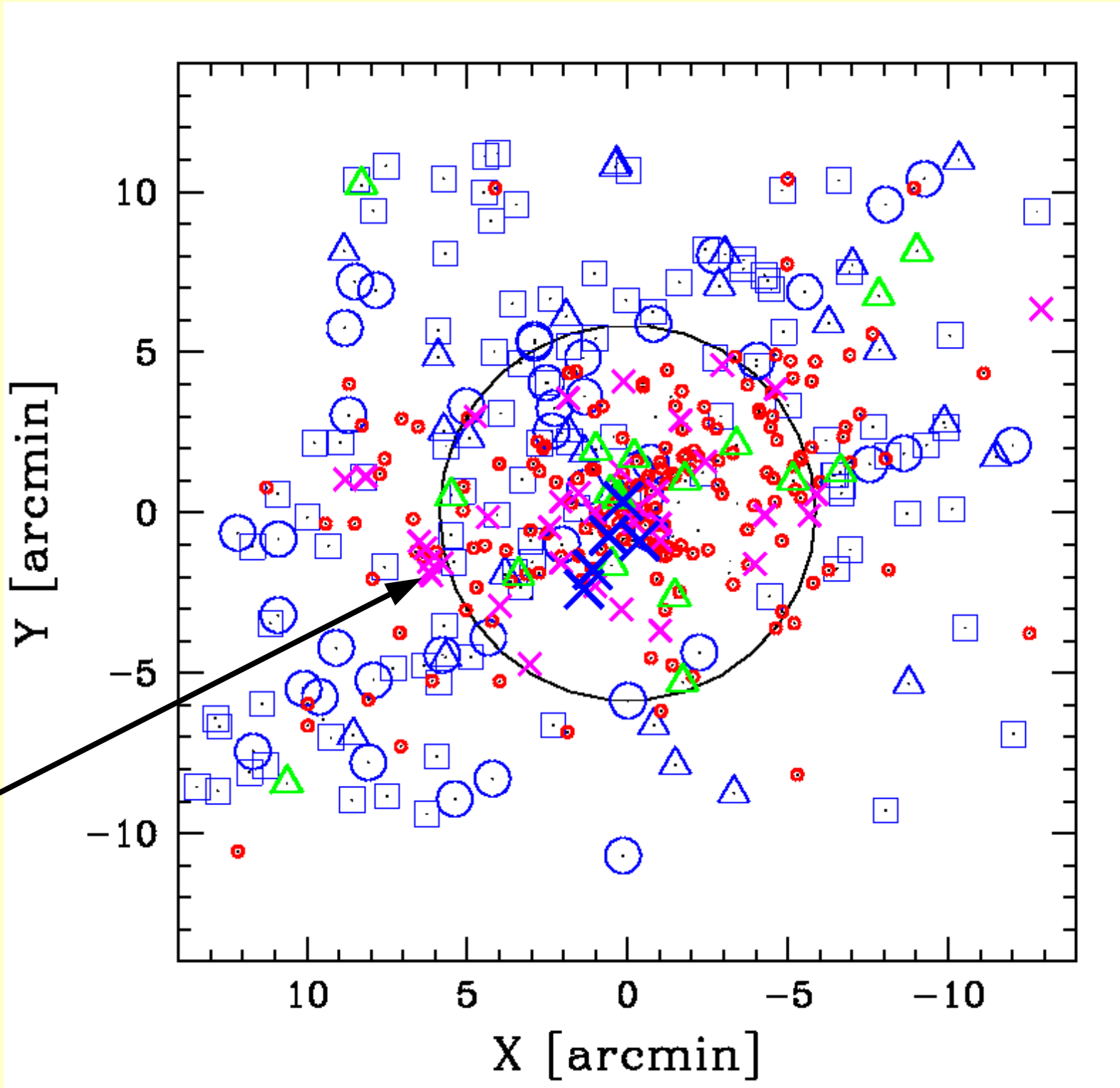


FIG. 5.—Population gradients in 6 moderately irregular clusters (A754, A993, A1736, A1983, 0326−53, 0559−40) as a function of radial distance from the cluster centroid and as a function of local surface density, showing the advantage of density as the free parameter.

Dressler 1980 ApJ 236, 351

Spatial Galaxy Distribution In cluster MACSJ1206

Girardi+2015

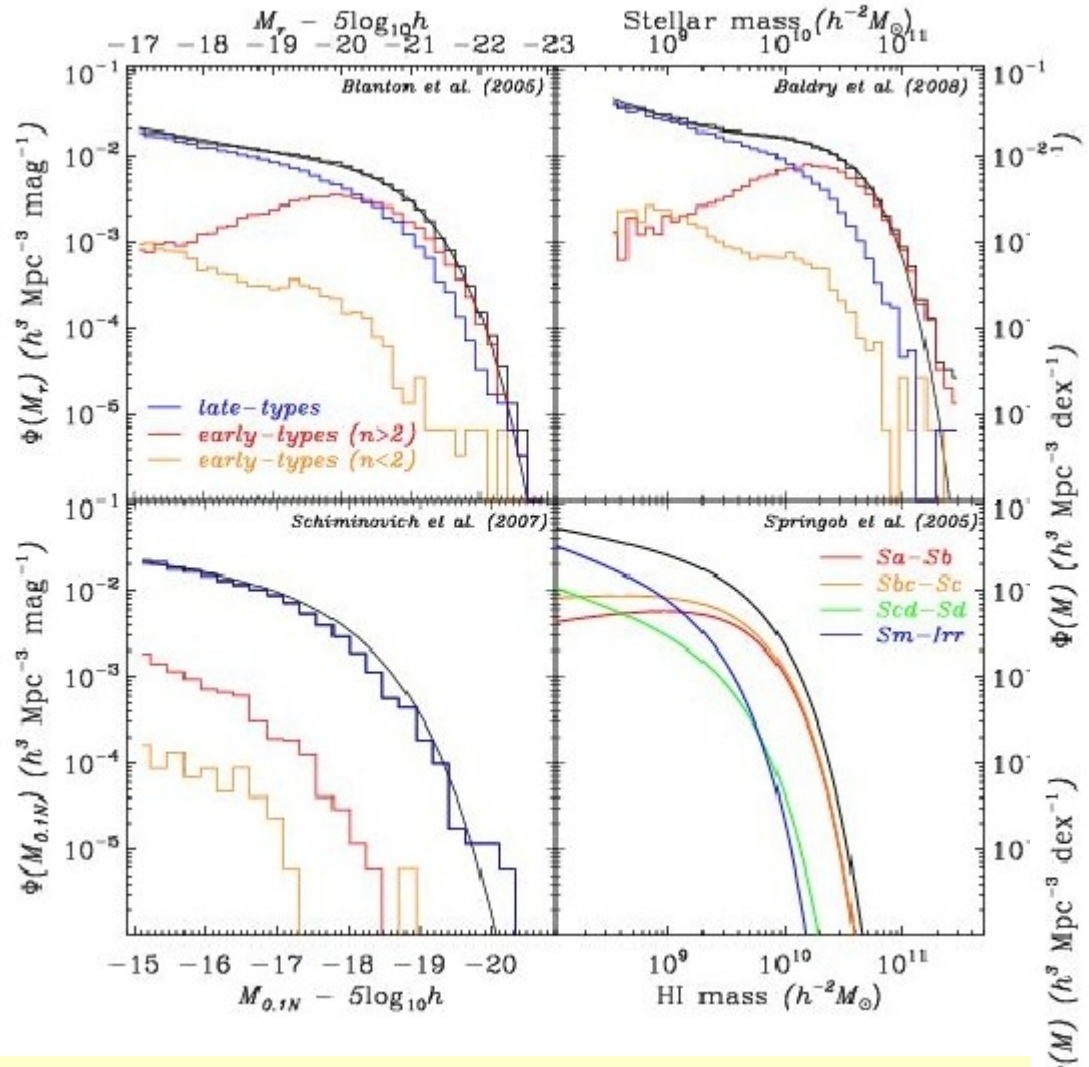


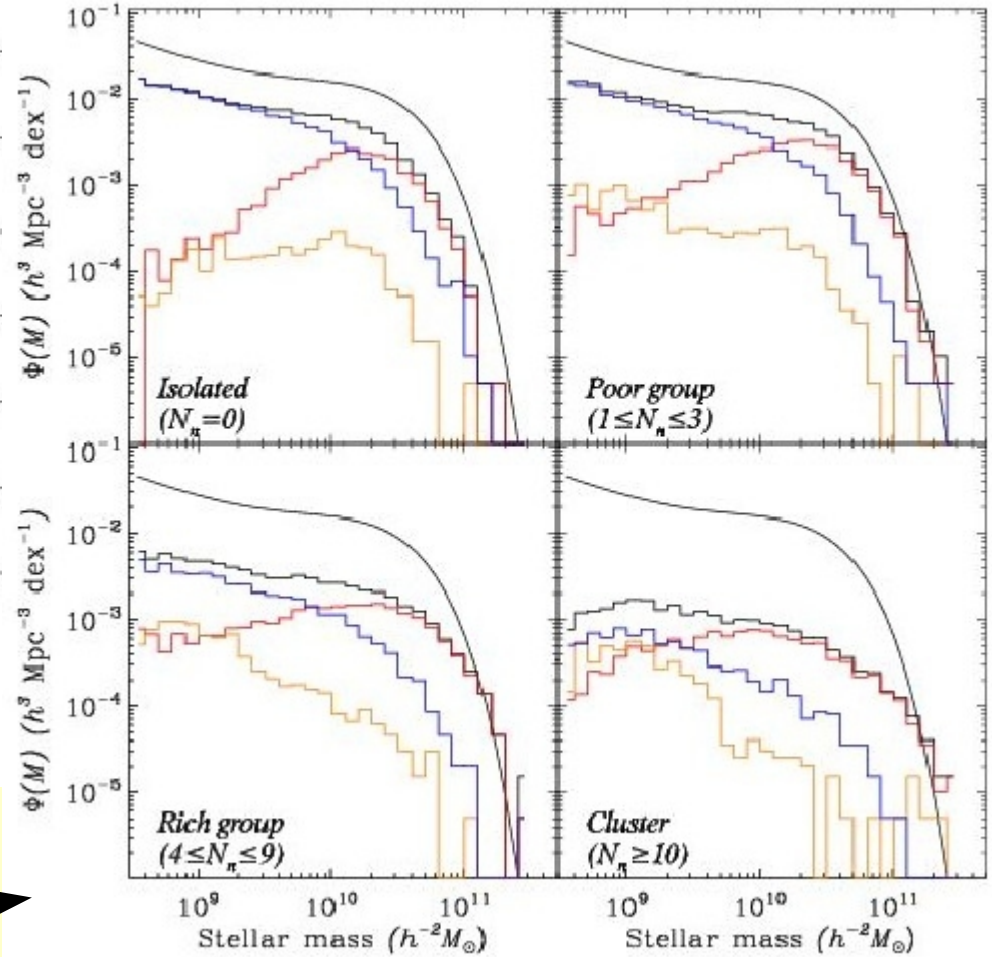
Different spectral types

optical

(M*/L*)red>(M*/L*)blue

Luminosity Function

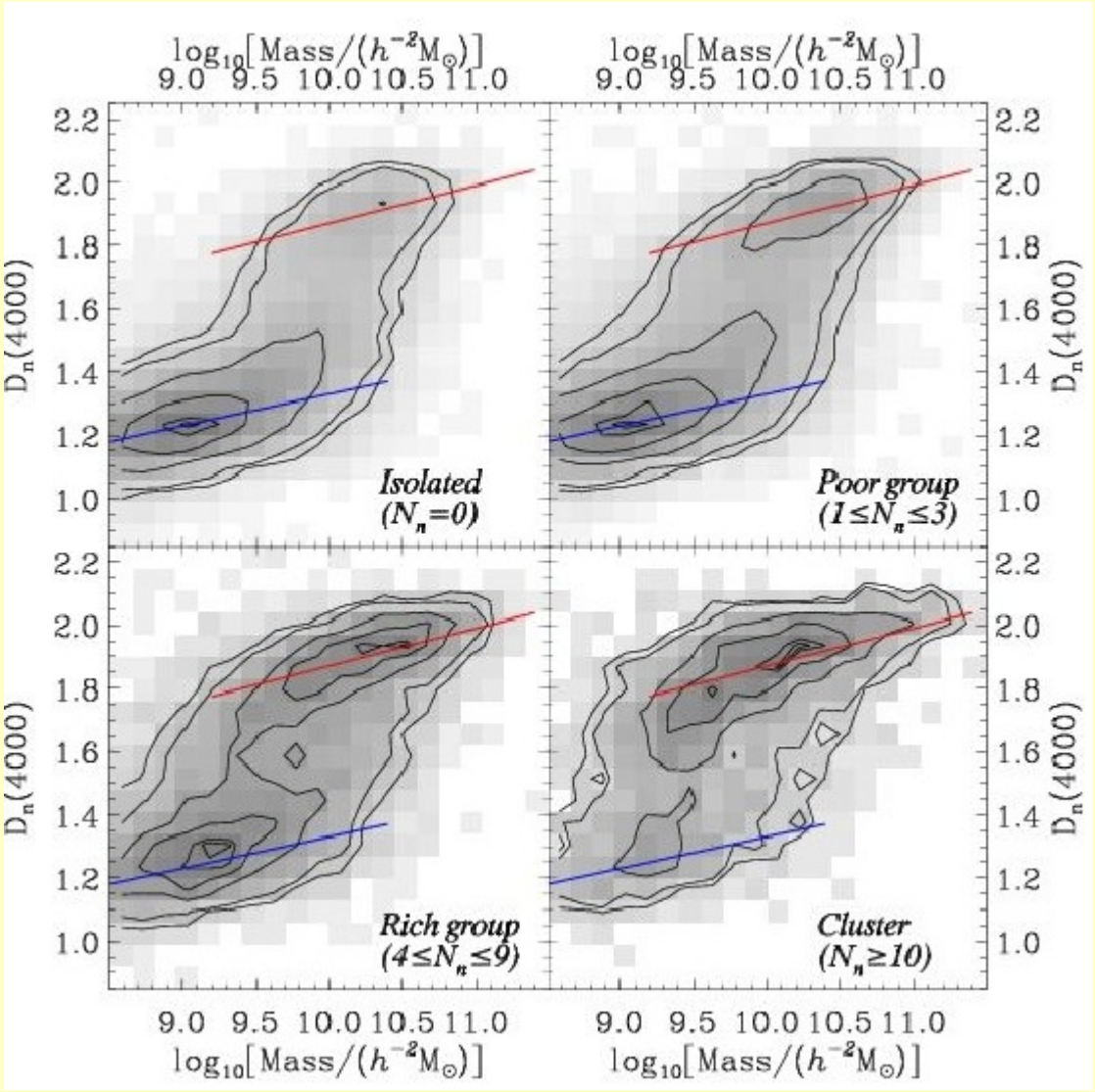




Fixed the type, LFs are similar,

Different gals populates different environments in a different way.

Relation between
Gals properties



Fixed the type of galaxy, the relations are similar.

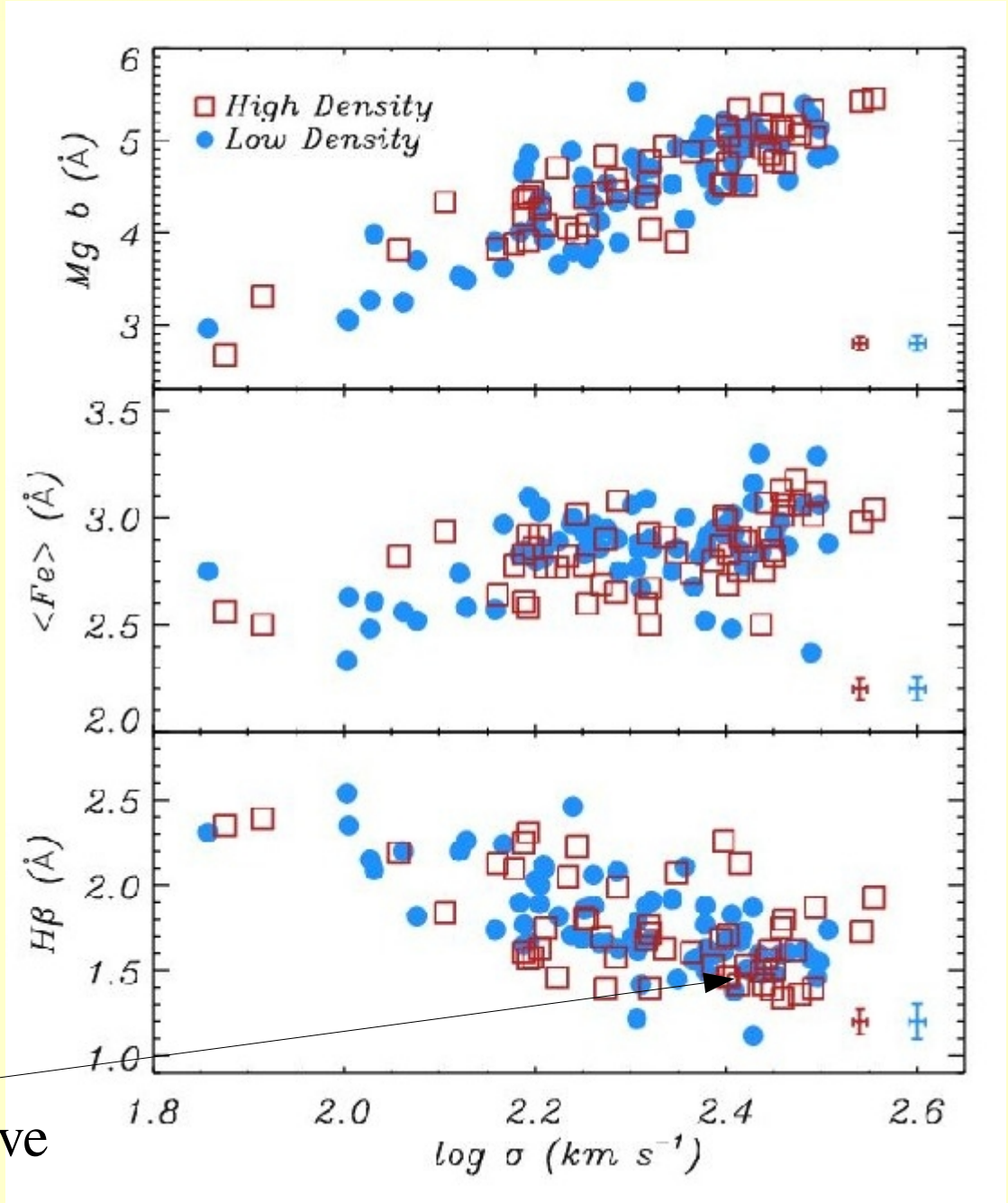
Different gals populates different environments in a different way.

+Fe

+Metals

+old-Hbeta

Old & massive



Field Ell
Are 2 Gyr
Younger?

BCG (brightest cluster galaxies) or cD (central dominant)

Are really connected to the environment

*the gap magnitude between BCG1 and BCG2 is not expected in the LF

*Halo (ICL?)

* BCG/cD luminosity is correlated with mass of the host cluster (lin+Mohr04)

(merger between clusters and merger between BCGs?

but L propto Mhalo^0.2-0.3, i.e. halo grows more than its BCG...)

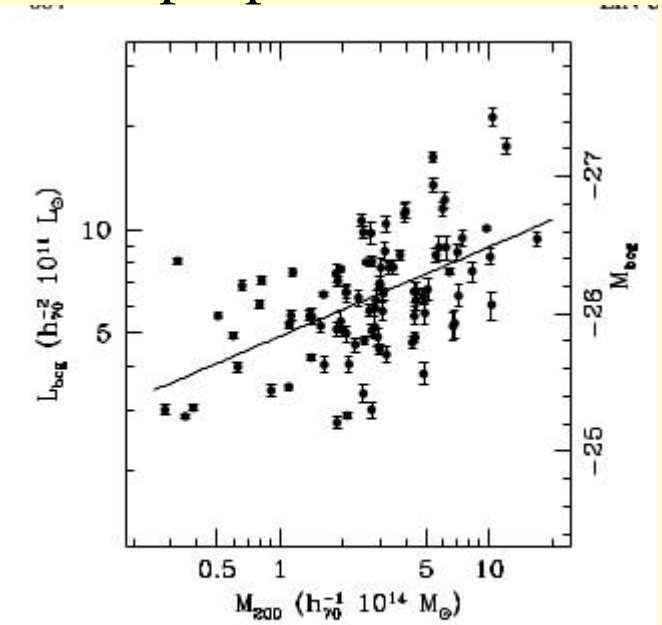


FIG. 3.—Correlation between the BCG luminosity (estimated from the isophotal magnitudes) and the cluster virial mass. On the right axis is shown the corresponding magnitudes. Overall the BCG luminosity scales with cluster mass as $L_b \propto M_{200}^{0.26\pm0.04}$ (*solid line*).

Possible scenarios for cD

*merger/cannibalism(dry mergers? multicores?)

*cooling flow and accretion of new stars (bluer but not enough...)

*being in central position, tidal radius is not limited