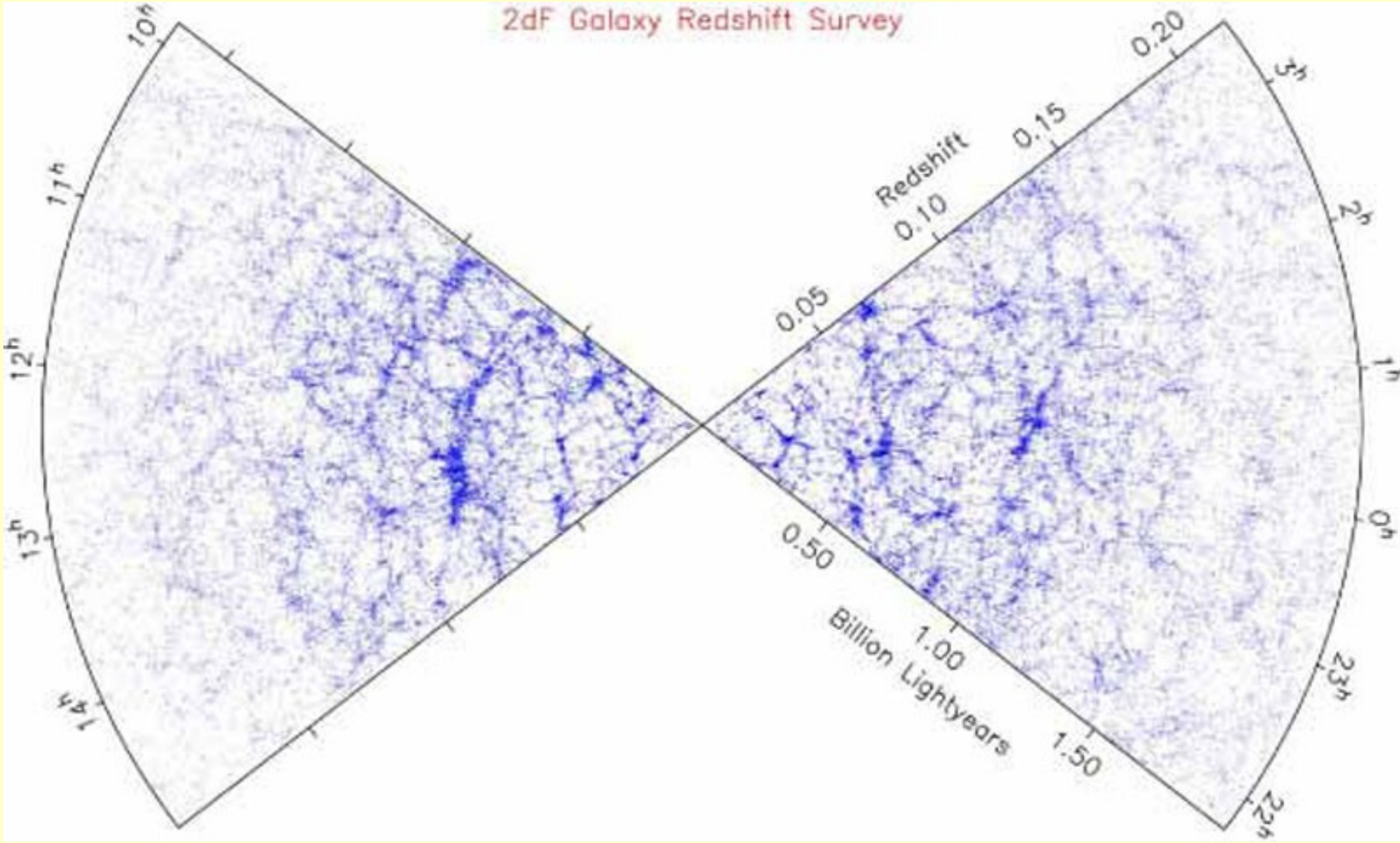
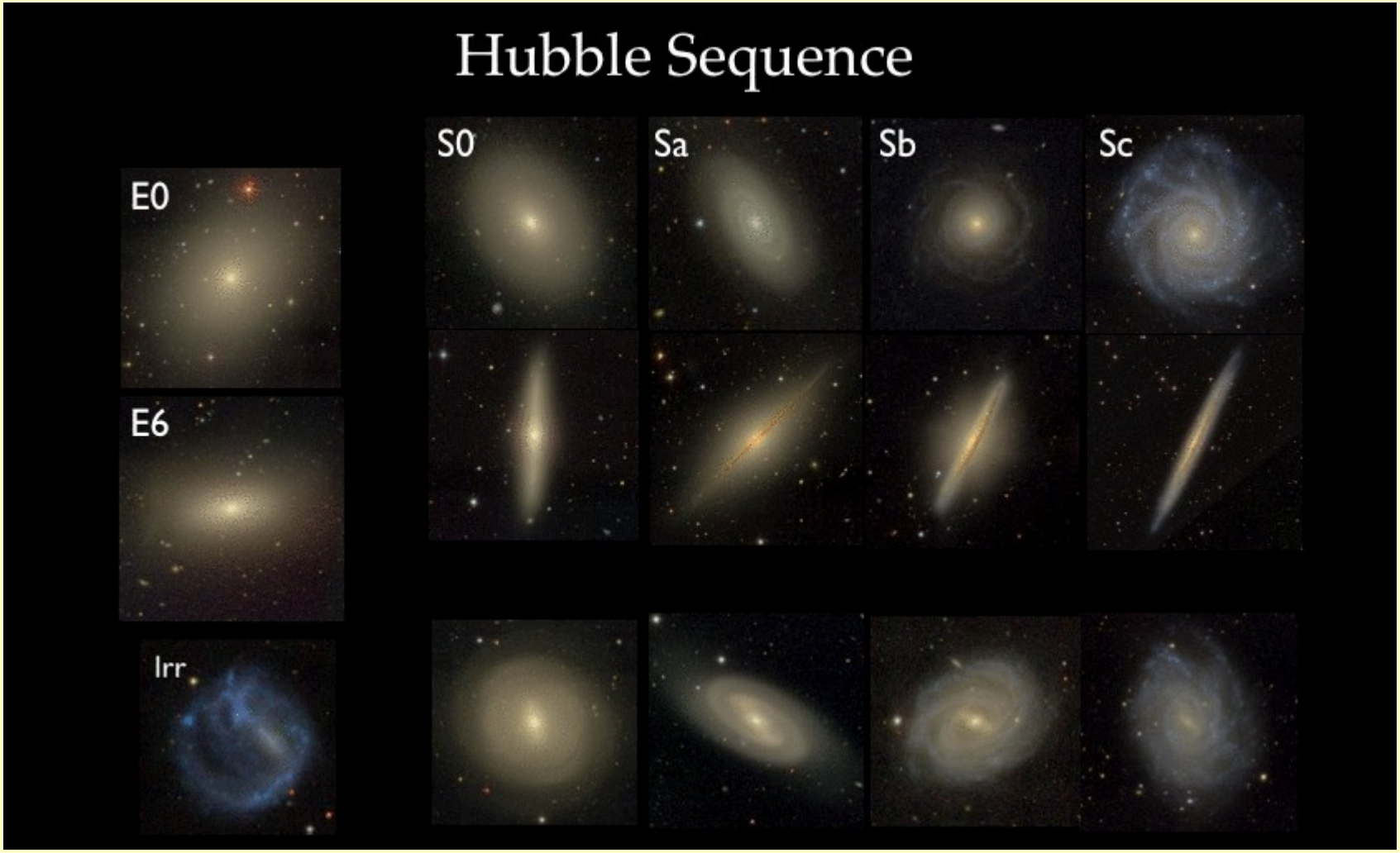
Galaxy distribution – Colless 2001



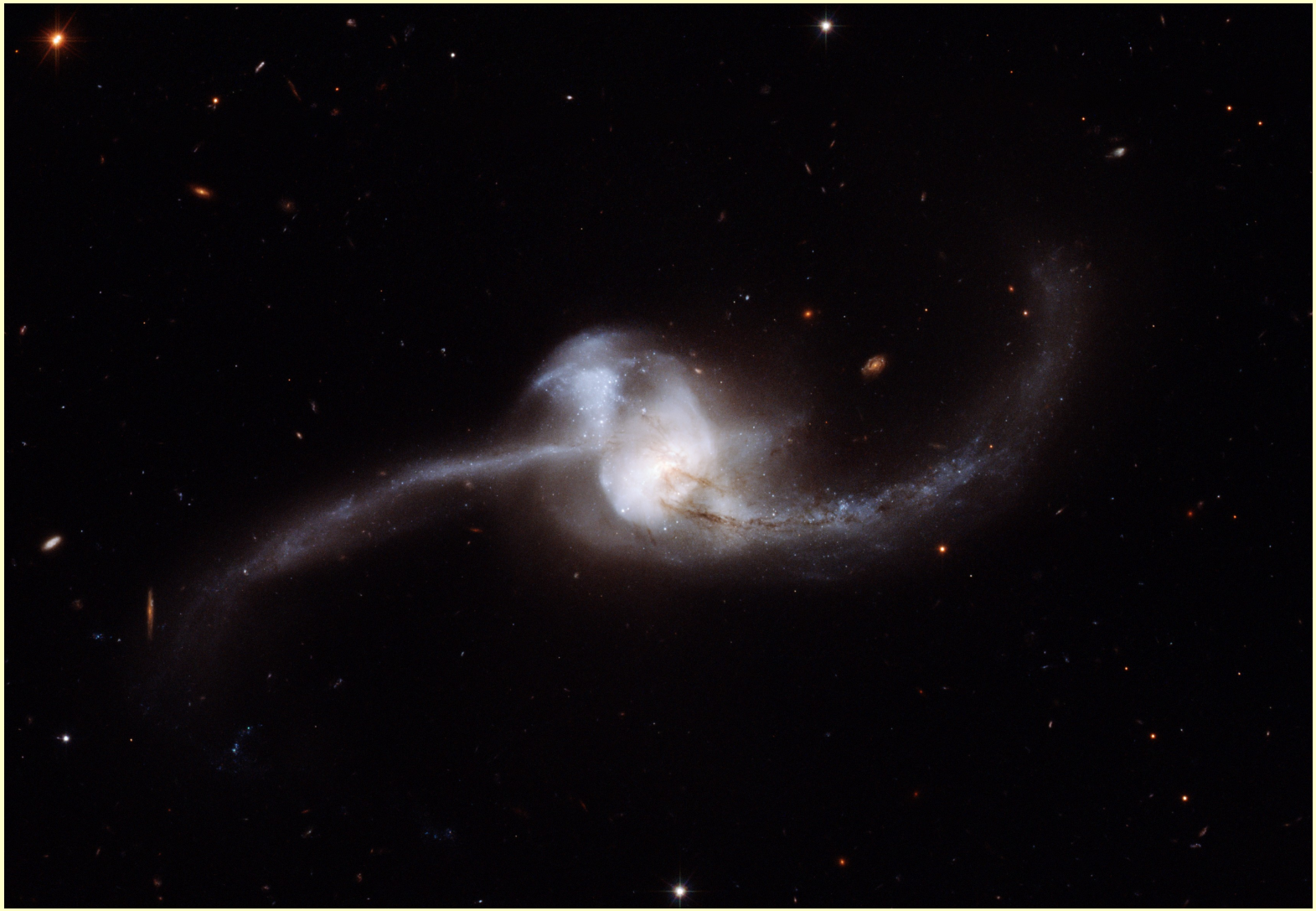
Galaxies differ for their morphologies



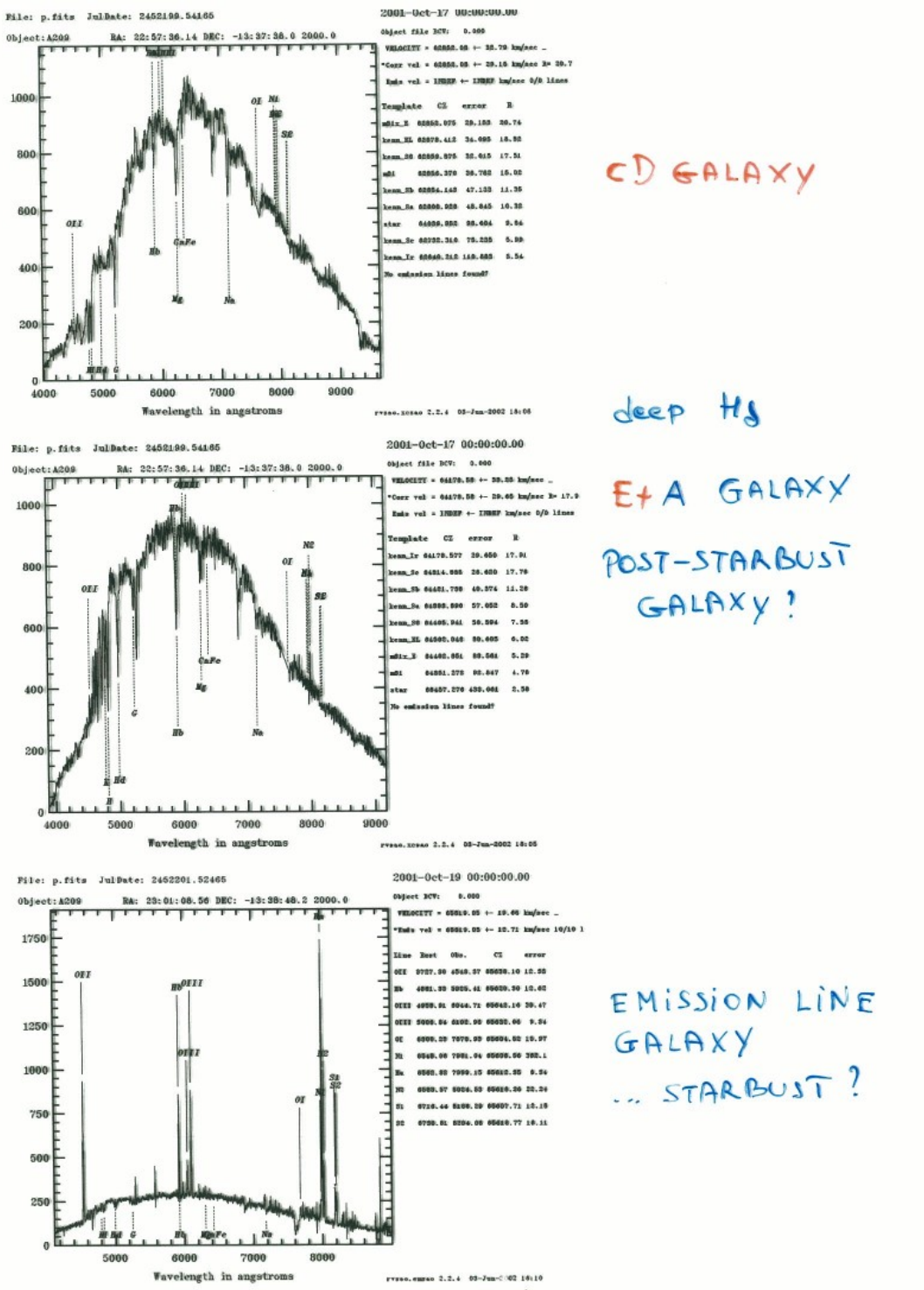
Credit to NASA-HST

Merging Galaxies and Environmental Effects
Credit NASA – Martin – here you can see tails of the tidal interaction

Merger: 2 galaxies → 1 galaxy



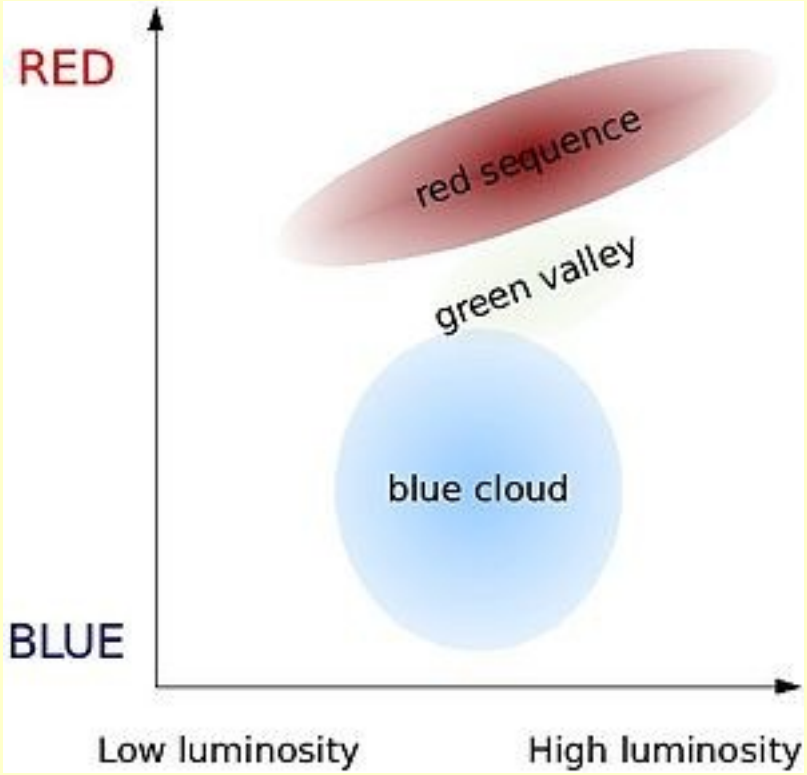
Galaxies differ for
their spectra



Abell 209
Girardi+Mercurio(PhD)
obs. NTT

Galaxies differ for their colors

Color-magnitude diagram



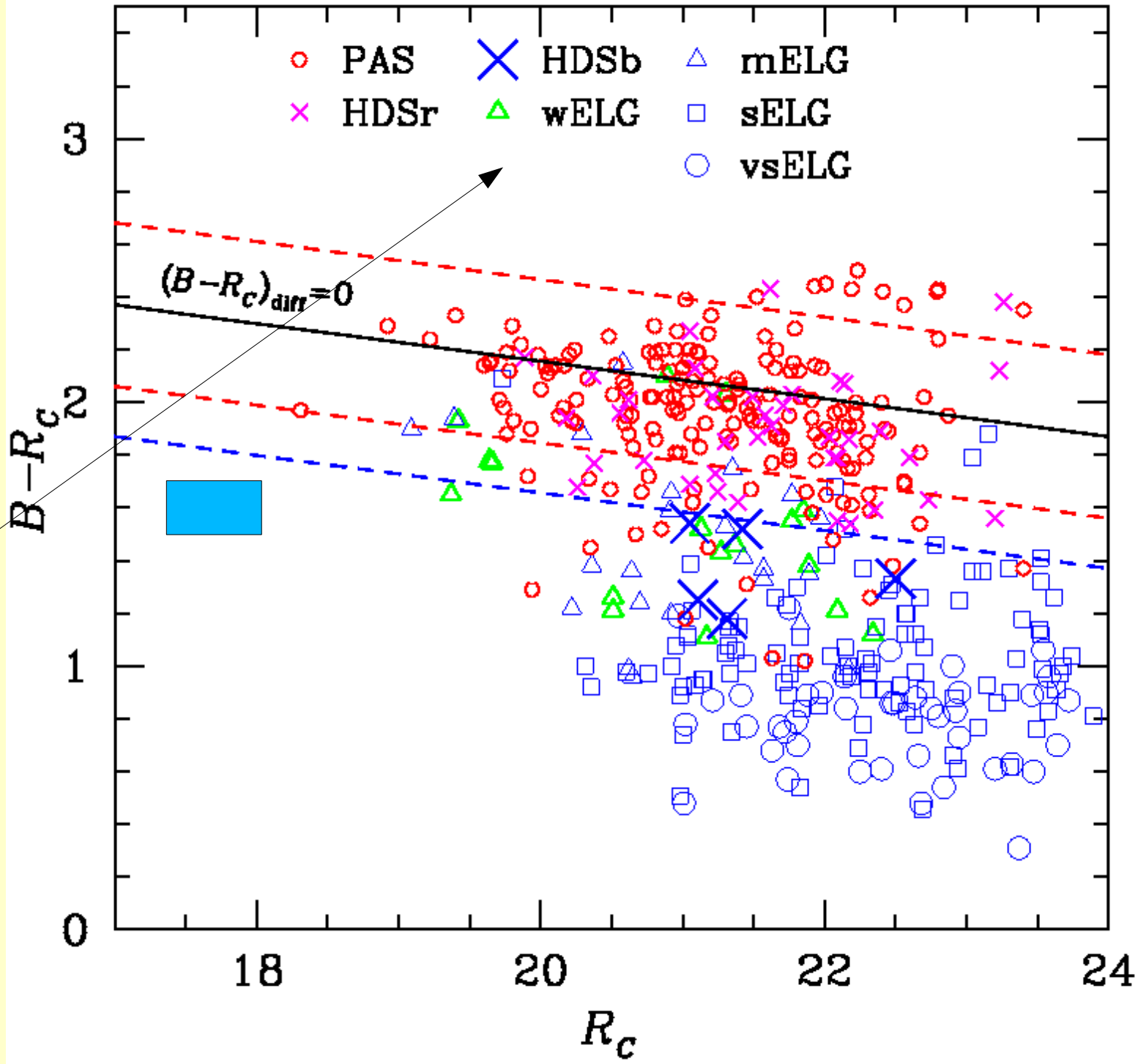
A mock-up of the galaxy color–magnitude diagram with three populations: the red sequence, the blue cloud, and the green valley. Credit to Wikipedia website

Galaxy dicothomy: EARLY TYPES Red Passive Spirals/Irregulars Galaxies
LATE TYPES Blue Star-Forming Ellipticals Galaxies

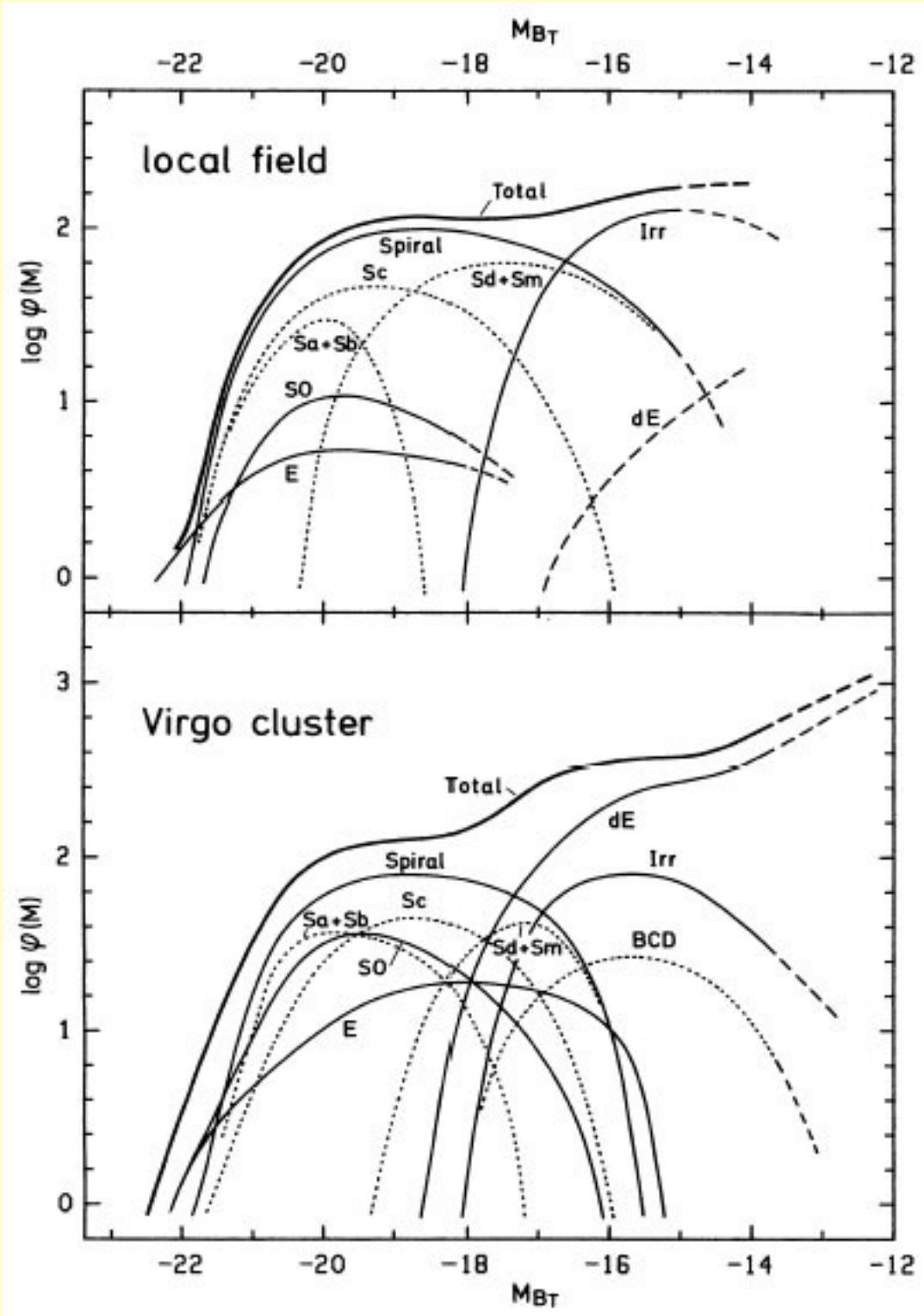
Color-Mag Relation for Cluster galaxies in MACSJ1206

Girardi+2015

Different spectral types



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

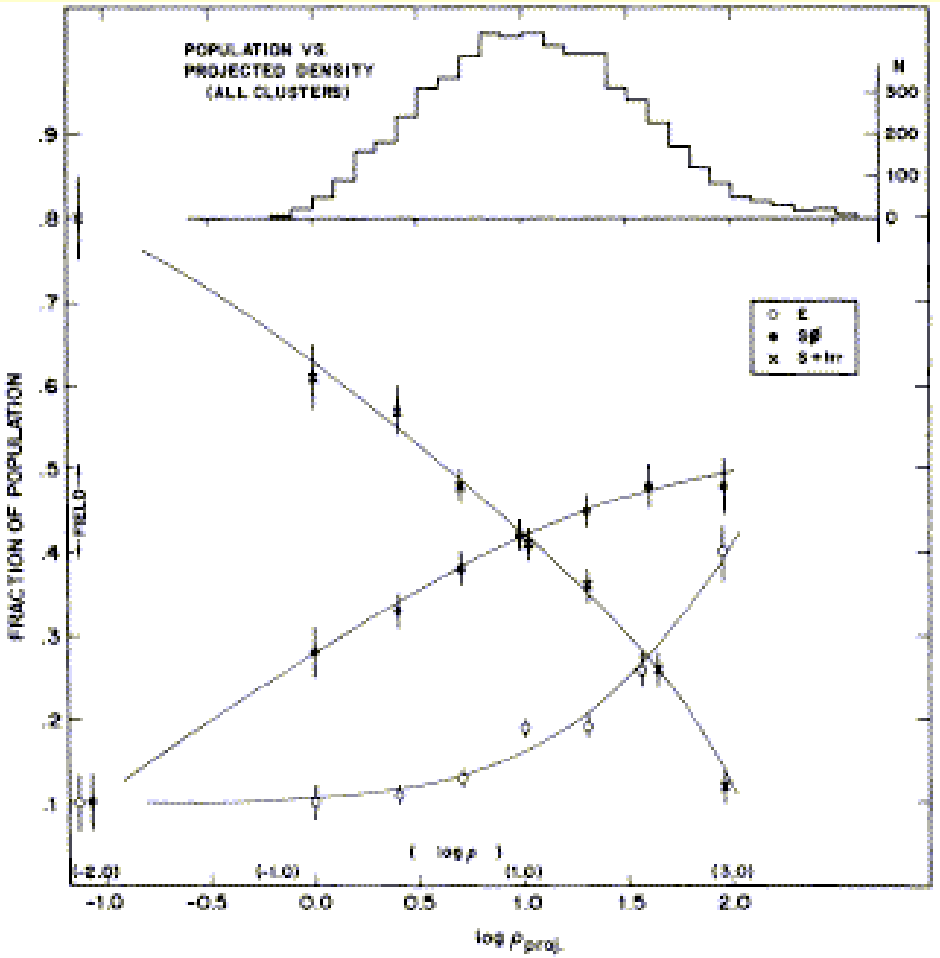


FIG. 4.—The fraction of E, S0, and S+I galaxies as a function of the log of the projected density, in galaxies Mpc^{-2}. The data shown are for all cluster galaxies in the sample and for the field. Also shown is an estimated scale of true space density in galaxies Mpc^{-3}. The upper histogram shows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

Dressler 1980 ApJ 236, 351

Morphology density relation

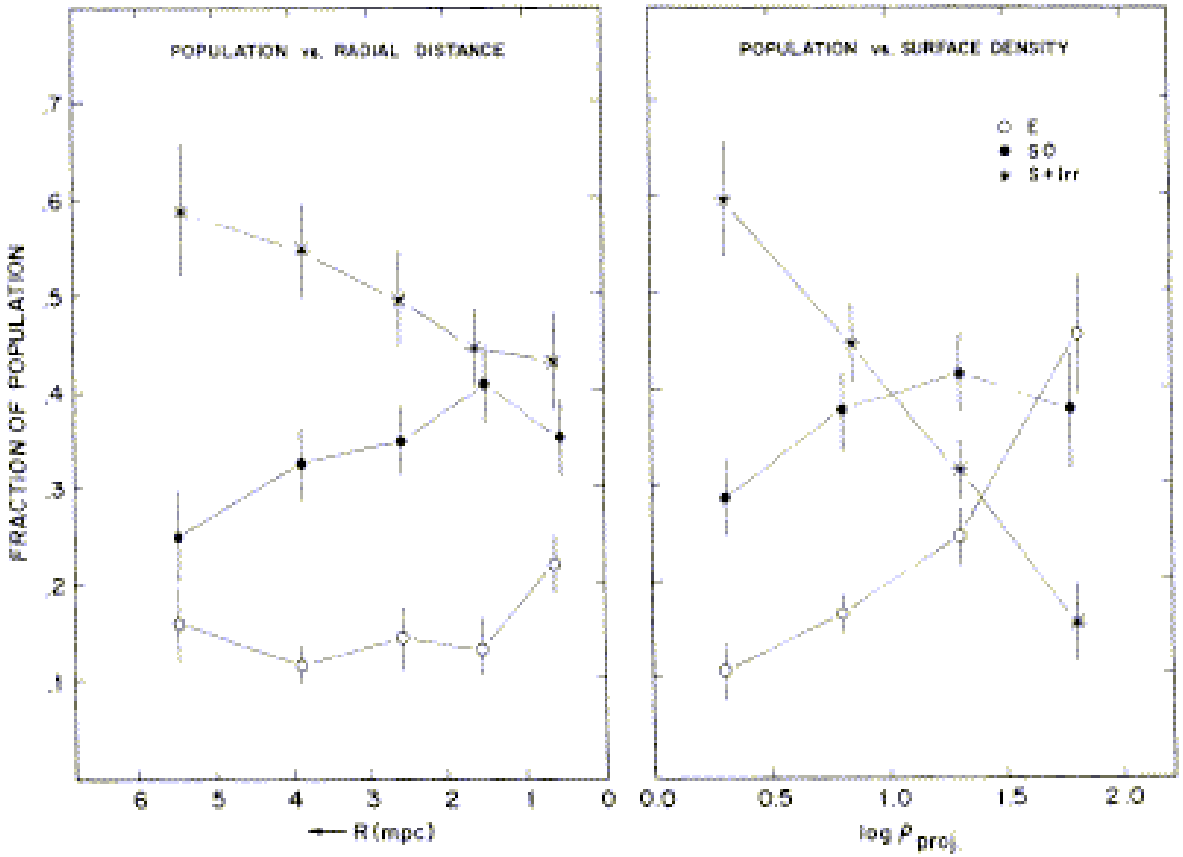
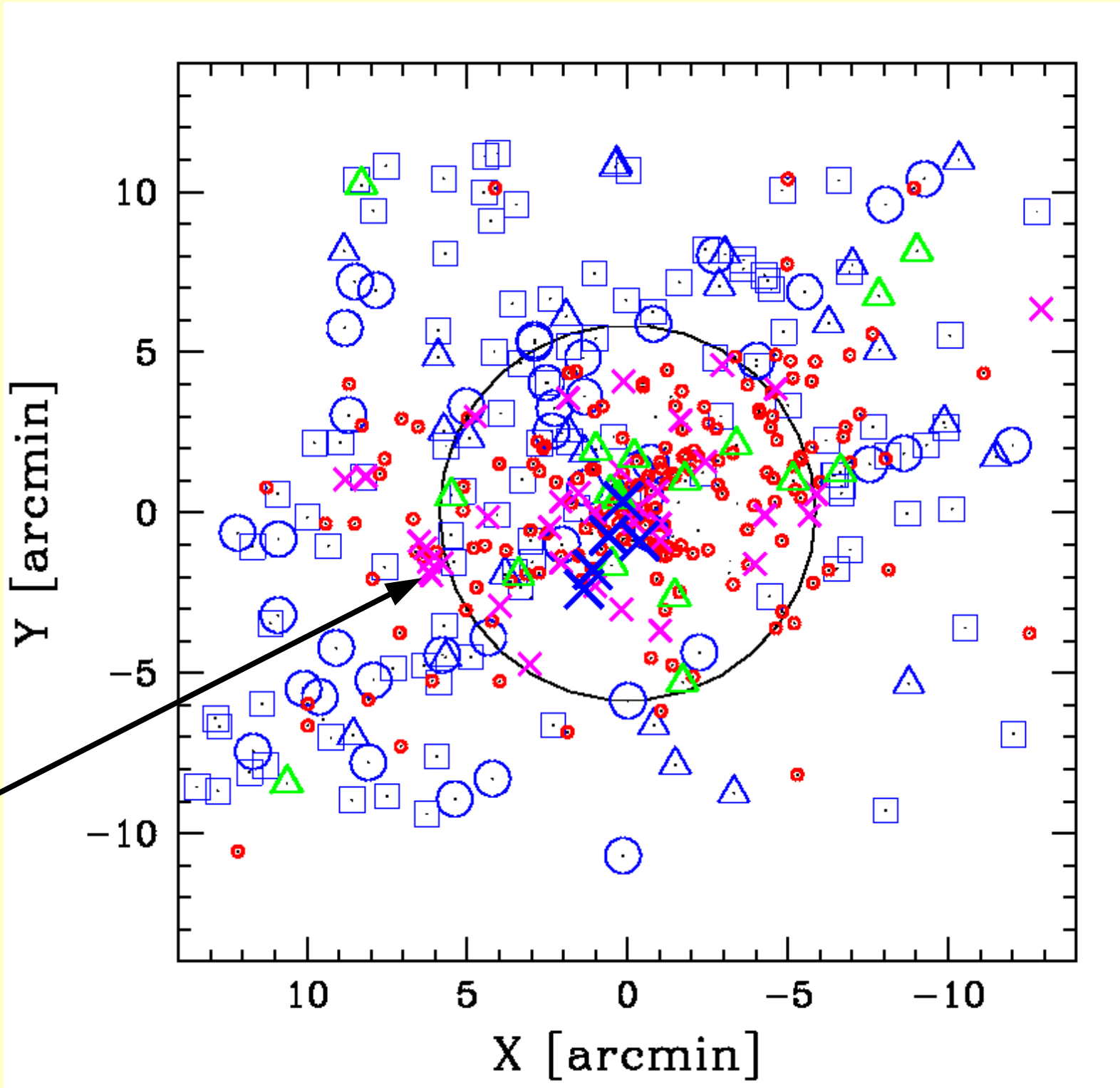


FIG. 5.—Population gradients in 6 moderately irregular clusters (A754, A993, A1736, A1983, 0326−53, 0559−40) as a function of radial distance from the cluster centroid and as a function of local surface density, showing the advantage of density as the free parameter.

Dressler 1980 ApJ 236, 351

Spatial Galaxy Distribution In cluster MACSJ1206

Girardi+2015



Different spectral types