Galaxy Luminosity Functions (contd)
LF of clusters

Overall shape can be roughly described by a Schechter LF (SLF) with a steeper slope (alpha = -1.3) than field LF.

Detailed shape of cluster LF deviates from SLF and has sub-structures, such as a dip at M(B) = -16 + 5 log h.
Acc. to Schechter LF (SLF), no of galaxies with \( L > 10 L^* \) (e.g., cD galaxies) are \(~\)inexistent.

SLF fails in center of very rich clusters, such as Coma, whose center contains a cD galaxy.
LF for different morphological types (E, S0, Sa-Sc, Irr dE) in both field and clusters!

Notice dominance of early type galaxies in LF of clusters (aka morphology-density relation)
- dE w.r.t. Irr at faint end
- S0 and E w.r.t. spirals at bright end
LF for different morphological types (E, S0, Sa-Sc, Irr, dIrr, dE) in the Virgo cluster. Notice dominance of early type galaxies in LF of clusters (aka morphology-density relation).
In central part of Abell 1689 Cluster: E/S0 dominate over spirals
Notice dominance of early type galaxies in center of rich clusters

**Figure 6.25** Coma cluster: solid dots show elliptical galaxies; open stars are spirals. Contours show the intensity of X-rays: the diffuse emission is from hot cluster gas; the point sources are distant active galaxies – M. van Haarlem.