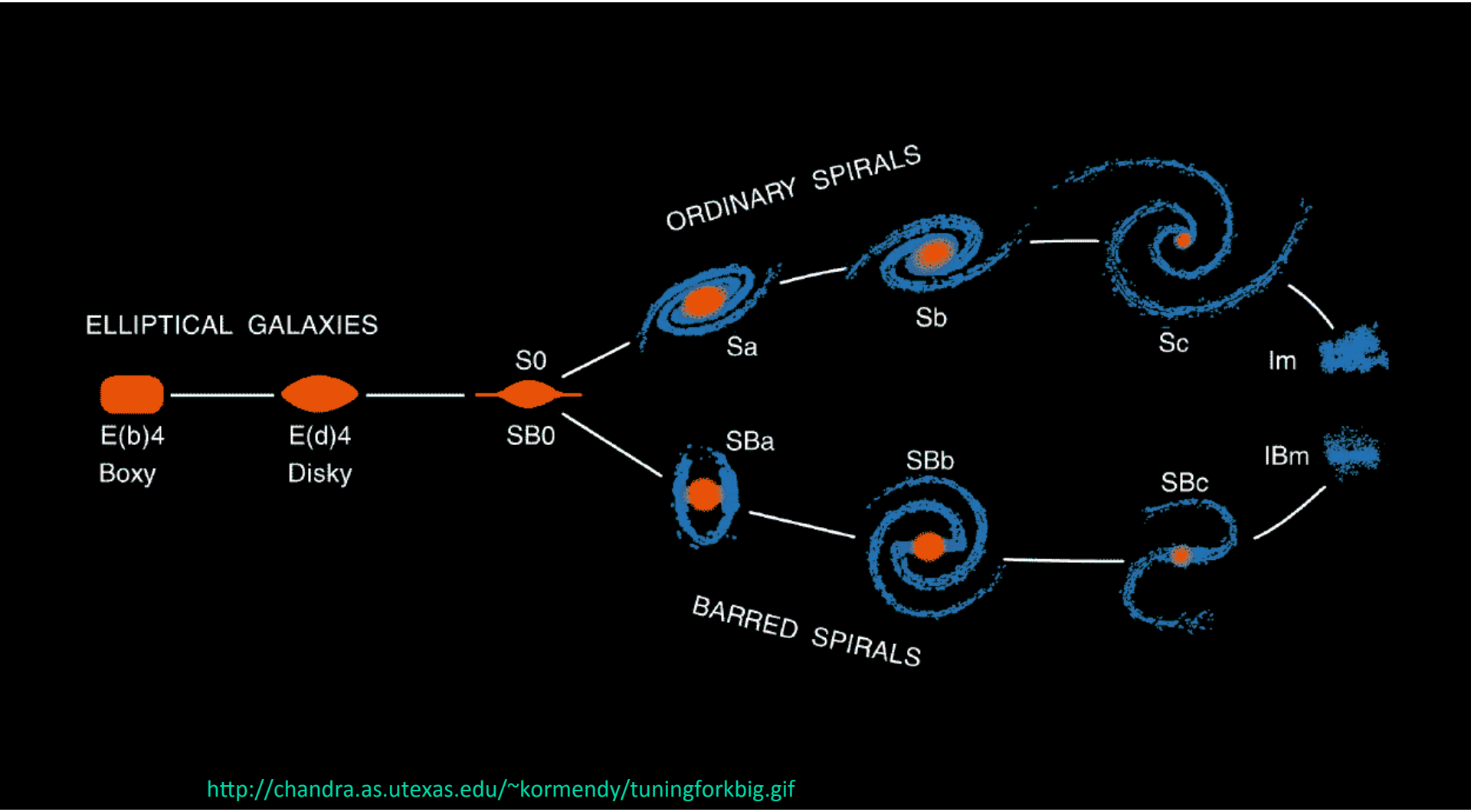
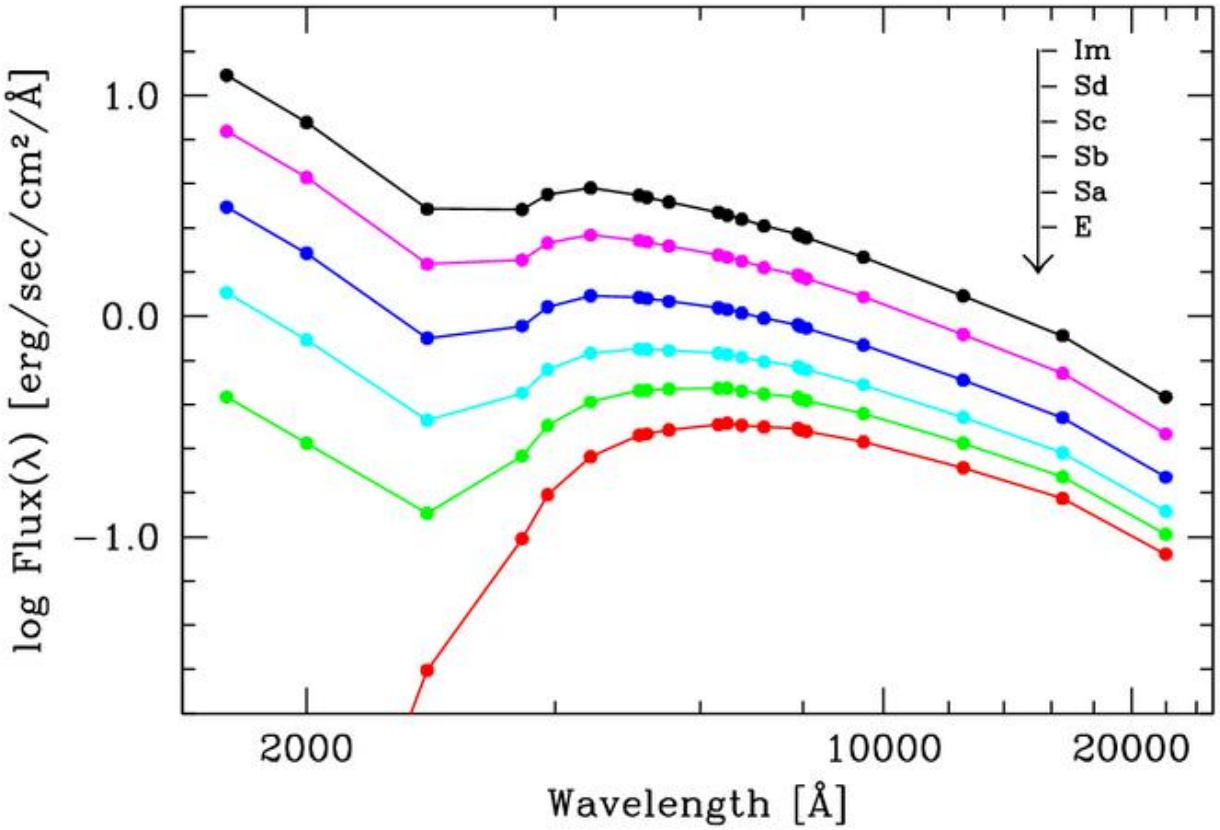
The “Hubble Sequence”



http://chandra.as.utexas.edu/~kormendy/tuningforkbig.gif

Galaxy SEDs vs. Hubble Type



http://www.bo.astro.it/~eps/templates/ff06.jpg

Galaxy Luminosity Function

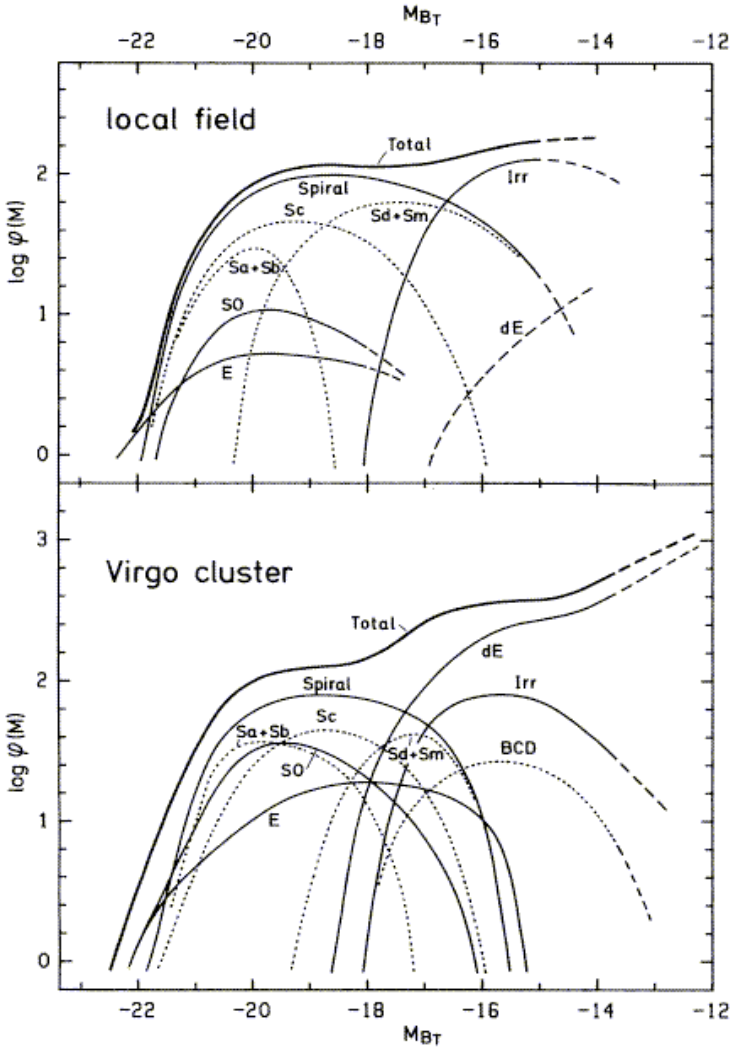


Figure 1 The LF of field galaxies (top) and Virgo cluster members (bottom). The zero point of $\log \varphi(M)$ is arbitrary. The LFs for individual galaxy types are shown. Extrapolations are marked by dashed lines. In addition to the LF of all spirals, the LFs of the subtypes Sa+Sb, Sc, and Sd+Sm are also shown as dotted curves. The LF of Irr galaxies comprises the Im and BCD galaxies; in the case of the Virgo cluster, the BCDs are also shown separately. The classes dS0 and "dE or Im" are not illustrated. They are, however, included in the total LF over all types (heavy line).

Bingelli, Sandage, and Tammann 1988 ARAA 26 50

The Sersic profile

- Empirically devised by Sersic (1963) as a good fitting fn

$$I(r) = I_0 \exp\left(-\left(\frac{r}{\alpha}\right)^{1/n}\right)$$

I(r) = intensity at radius r

I_0 = central intensity (intensity at centre)

α = scalelength (radius at which intensity drops by e^{-1})

n = Sersic index (shape parameter)

Can be used to describe most structures, e.g.,

Elliptical: 1.5 < n < 20 Bulge: 1.5 < n < 10

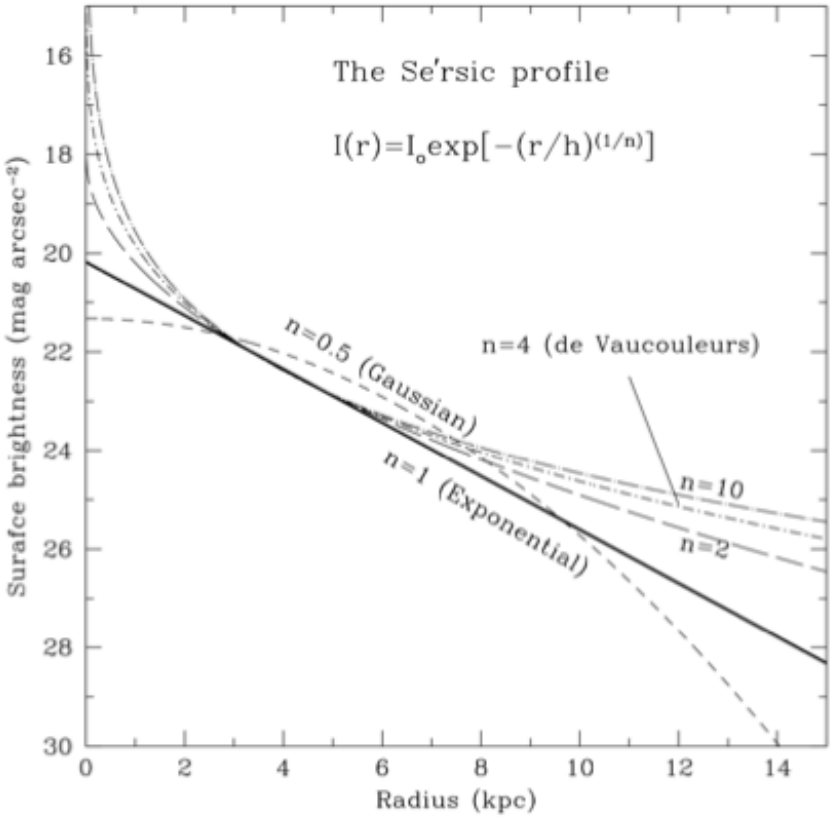
Pseudo-bulge: 1 < n < 2 Bar: n~0.5

Disc: n~1

Total light profile = sum of components.

http://star-www.st-and.ac.uk/~spd3/Teaching/AS3011/AS3011_5.pdf

Sersic shapes



http://star-www.st-and.ac.uk/~spd3/Teaching/AS3011/AS3011_5.pdf