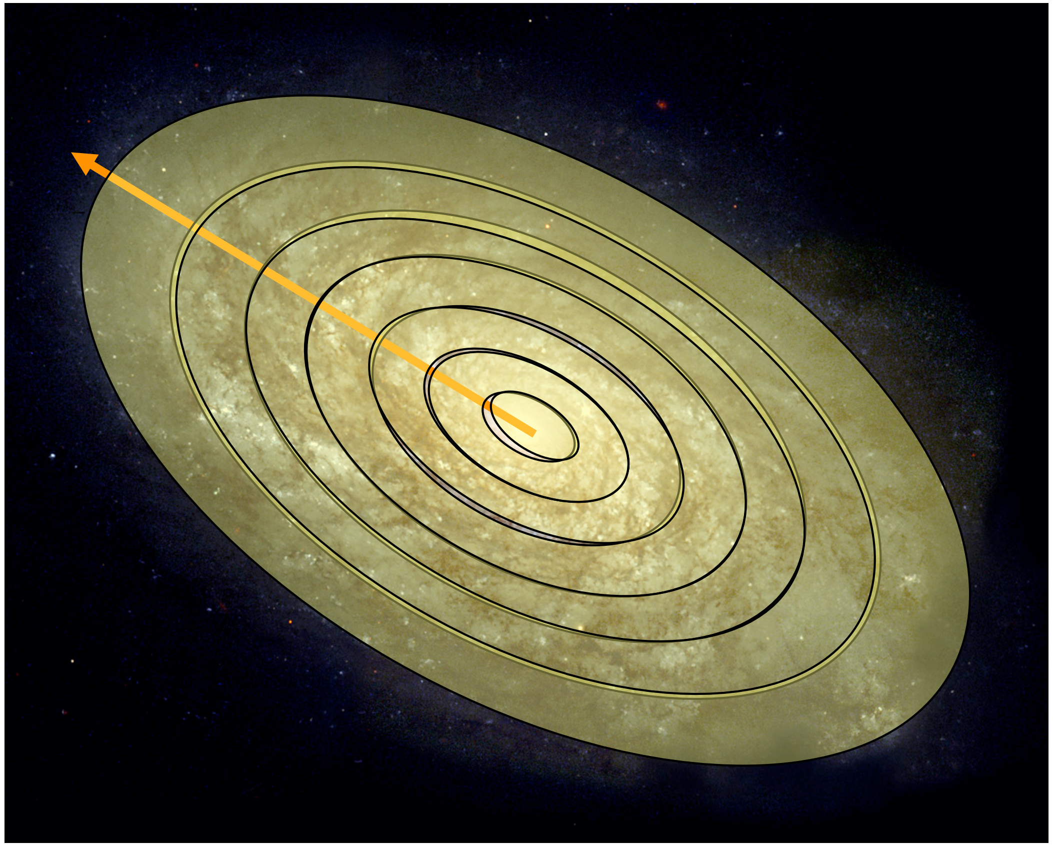
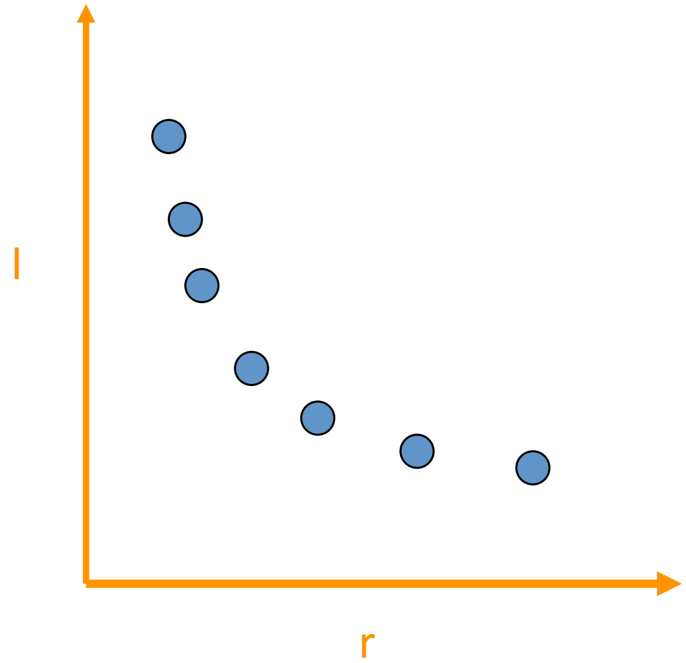
Galaxy light profiles

Fit ellipses and then average radially -- this will average over dust lanes, etc





Galaxy light profiles

Disk galaxy light tends to fall off fairly slowly with radial distance: an exponential function is often a good description

$$I(r) = I_0 \exp(-r/r_0)$$

Galaxy light profiles

Traditionally, a de Vaucouleurs R^1/4 law profile has been fitted to ellipticals

$$I(r) = I_0 \exp\left(-\left(r/r_0 \right)^{\frac{1}{4}} \right)$$

Photometry of disk galaxies

Simplest disk galaxies (Sc, Sd) have only a disk, usually well fit by an exponential

$$\rho \propto e^{-R/h_r} \, e^{-z/h_z}$$

The rest will have two components:

~~a~~ bulge — $r^{1/4}$ law for large bulges
— exponential for smaller ones

+ disk

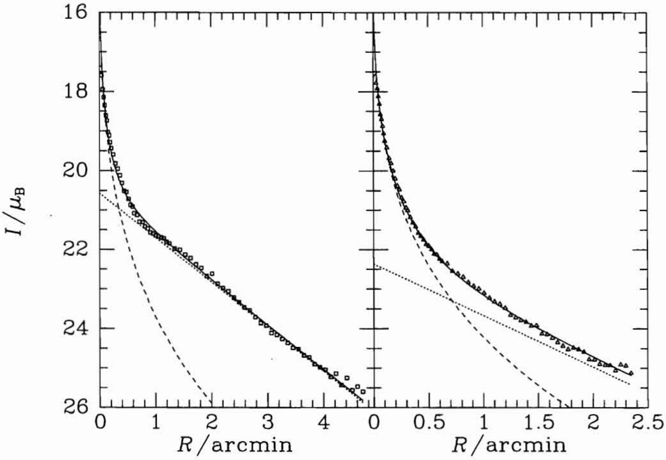


Figure 4.48 Fits to the surface-brightness profiles of NGC 2841 (left) and NGC 3898 (right). The dotted curves show the exponential fits to the disks and the dashed curves show the $R^{1/4}$ fits to the bulges; the full curves show the sums of these components. [From data published in Boroson (1981)]

Galaxy light profiles

A Sersic profile is a good overall function to ues: it reduces to an exponential for n=1 and to an R^1/4 law for n=4

$$I(r) = I_0 \exp\left(-(r/r_0)^{\frac{1}{n}} \right)$$