

**AST 300B – Spring 2019**  
**In-class Problems Due: Wednesday January 16**

2. Spiral and elliptical galaxies have azimuthally-averaged surface brightness that may be fit by a “Sersic profile”:

$$I(\theta) = I_{pk} \exp[-\beta(\theta/\theta_0)^{1/n}]$$

where  $I_{pk}$ ,  $\theta_0$ ,  $\beta$ , and  $n$  are parameters that are constant for a given galaxy. Elliptical galaxies and the bulges of spirals have  $n \sim 2 - 6$  (usually  $n \sim 4$ ) while spiral galaxies that are disk dominated are found to have  $n = 1$  (exponential disks). What is the flux observed for a disk-dominated spiral galaxy that is observed face on? HINT: Make assumptions about the size of the galaxy and about the limits of integration to make this calculable/simple.



Figure 1: A face-on spiral galaxy