

# SOME ASTRONOMY

## THE MAGNITUDE

- relative brightness of STARS
- CONSIDER 2 stars, "1" & "2" that have "brightness"  $S_1$  &  $S_2$   
(ENERGY FLUX as observed on earth)

$$\rightarrow m_1 - m_2 = -2.5 \log\left(\frac{S_1}{S_2}\right)$$

DIFFERENCE IN MAGNITUDE

$\rightarrow$  RELATIVE MEASURE

STAR @ DISTANCE  $r$ , LUMINOSITY  $L$ :

$$F = \frac{L}{4\pi r^2}$$

$$\rightarrow m = -2.5 \log\left(\frac{L}{4\pi r^2}\right) + \text{CONST.}$$

DEF ABSOLUTE magnitude  $M$  of star:

APPARENT MAGNITUDE @ DISTANCE 10 pc

$$1 \text{ pc} = 3.26 \text{ LYR}$$

$$\rightarrow \text{DISTANCE MODULUS} \quad m - M = 5 \log\left(\frac{r}{10 \text{ p.c.}}\right)$$

# SUN (REFERENCE POINT)

APPARENT (BOLOMETRIC) LUMINOSITY OF SUN

$$M_{\text{BOL}, \odot} = -26.83 \text{ MAG}$$

$$M_{\text{BOL}, \odot} = 4.74 \text{ MAG}$$

$$\rightarrow M_{\text{BOL}} = 4.74 - 2.5 \log\left(\frac{L}{L_{\odot}}\right) \quad [\text{MAG}]$$