$$\pi = \arctan\left(\frac{b}{d}\right)$$

$$\pi \simeq \left(\frac{b}{d}\right)$$

$$d = \left(\frac{b}{\pi}\right)$$

$$\pi = 100 \pm 20 \text{ mas}$$

$$\pi = 10 \pm 7 \text{ mas}$$

$$\text{fractional uncertainty in parallax} = \frac{\sigma_\pi}{\pi}$$

$$\frac{10 \text{ mas}}{\pi} > 0.10 \rightarrow \pi > 100 \text{ mas}$$

$$\rightarrow d < 10 \text{ pc}$$

$$\pi = 2.39 \pm 0.03 \text{ mas}$$

$$\text{size of PSF } \theta \sim \frac{\lambda}{D}$$

$$d = \frac{1}{\pi}$$