

Astronomers use cgs units while Physicists use MKS/SI units

| <u>cgs units</u> | | <u>MKS/SI units</u> | <u>conversion</u> |
|------------------|-----|---------------------|---|
| length | cm | m | $10^2 \text{ cm} = 1 \text{ m}$ |
| mass | g | kg | $10^3 \text{ g} = 1 \text{ kg}$ |
| time | s | s | 1 : 1 |
| energy | erg | J | $10^7 \text{ erg} = 1 \text{ J}$ |
| charge | esu | C | $3 \times 10^9 \text{ esu} = 1 \text{ C}$ |

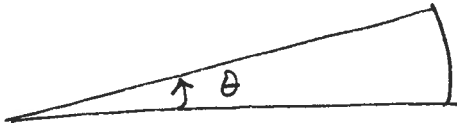
Fundamental Constants

| | | | |
|---|------------------------|--|---|
| c | speed of light | $2.998 \times 10^{10} \text{ cm}$ | $= 2.998 \times 10^8 \text{ m}$ |
| h | Planck's constant | $6.626 \times 10^{-27} \text{ erg}\cdot\text{s}$ | $= 6.626 \times 10^{-34} \text{ J}\cdot\text{s}$ |
| k | Boltzmann's constant | $1.381 \times 10^{-16} \text{ erg/K}$ | $= 1.381 \times 10^{-23} \text{ J/K}$ |
| G | Gravitational constant | $6.673 \times 10^{-8} \frac{\text{cm}^3}{\text{g}\cdot\text{s}^2}$ | $= 6.673 \times 10^{-11} \frac{\text{m}^3}{\text{kg}\cdot\text{s}^2}$ |

Astronomers also use some special units:

| | |
|------------|---|
| length | light year = 1 ly = $9.461 \times 10^{17} \text{ cm}$ |
| | Astronomical unit = 1 AU = $1.496 \times 10^{13} \text{ cm}$ |
| mass | solar mass = $1 M_{\odot} = 1.989 \times 10^{33} \text{ g}$ |
| luminosity | solar luminosity = $1 L_{\odot} = 3.9 \times 10^{33} \text{ erg/s}$ |
| time | year $\sim 3.1 \times 10^7 \text{ s}$ |

Angular Units



Arcminutes $60' = 1^\circ$

Arcseconds $60'' = 1'$

$\Rightarrow 3600'' = 1^\circ$

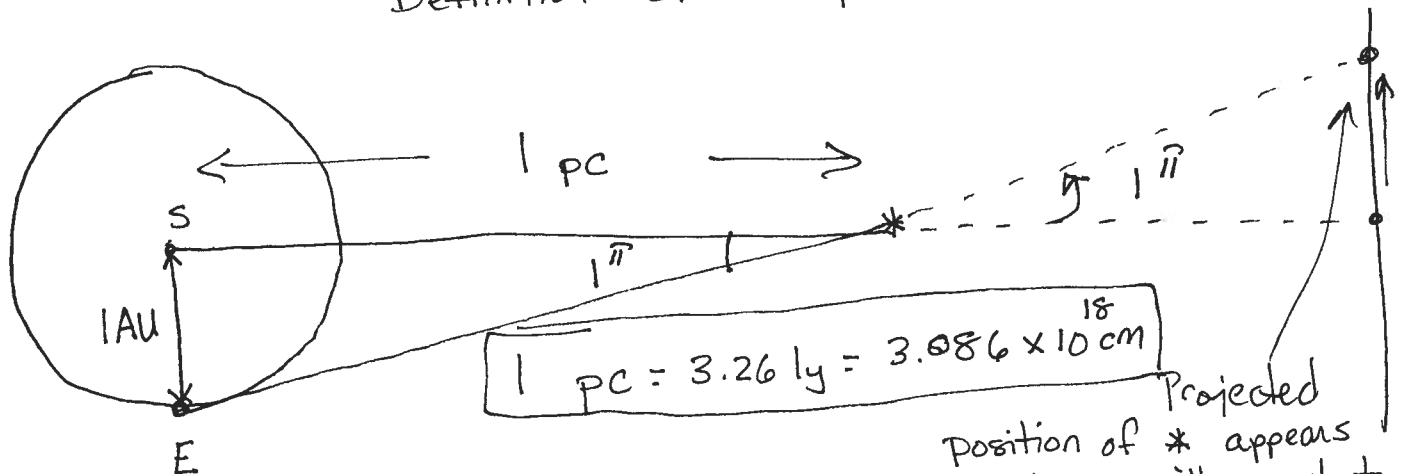
Also subdivisions of arcseconds: $1 \text{ mas} = 10^{-3}''$
 $1 \mu\text{as} = 10^{-6}''$

Handy conversion:

$206264.8'' = 1 \text{ radian}$

Parallax

Definition of a parsec



1st measured parallax by Friedrich Bessel
 in 1838 (61 Cygni $\pi = 0.3''$)