



# AstroLingo

A concise guide to terms we use in astronomy...

**How Big? How Far? Units of Distance**  
 We all use units of **distance** in everyday life. How tall is your brother? "Over six **feet**." How far away is your hometown? "About 200 **miles**" Similarly, astronomers use different **units** to measure different **distances**.

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- m = meter** = 100 centimeters, about 3.3 feet
  - km = kilometer** =  $10^3$  meters
  - nm = nanometer** =  $10^9$  meters
  - mm = millimeter** =  $10^3$  meters
  - AU = Astronomical Unit** =  $10^{16}$  meters = 150 million kilometers ( $1.5 \times 10^8$  km) = 93 million miles (the distance from Earth to the SUN)
  - l.y. = light year** =  $9.5 \times 10^{12}$  km = 6 trillion miles (the distance light travels in 1 year)
  - pc = parsec** = 3.25 light years =  $3 \times 10^{16}$  meters
  - Mpc = Megaparsec** = 1 million parsec ( $10^6$  pc)

**Other Units**  
 We measure the characteristics of stars and other bodies with these *units*.

- Temperature (T):** Kelvins (**K**). (the freezing point of water is a temperature of 273 **Kelvins** =  $0^\circ\text{C}$  =  $32^\circ\text{F}$ .)
- Mass (M):** Kilograms (**kg**) or Solar Masses ( **$M_{\text{Sun}}$** )
- Time (t):** Seconds (**s**), days (**d**), or years (**yr**). (There are 86,400 seconds in a day.)
- Speed or Velocity (v):** meters per second (**m/s**) or **km/s**
- Energy (E):** joules (**J**). (It takes 100 **Joules** of energy to power a 100-watt lightbulb for 1 second.)

Greek Letters

are used for the names of bright stars within a constellation (starting with  $\alpha$ ) and for the names of constants and variables in equations

| Greek letter     | Astronomy Examples  |
|------------------|---|
| $\alpha$ Alpha   | $\alpha$ Centauri, $\alpha$ particles                       |
| $\beta$ Beta     | $\beta$ Pictoris (a young star)                             |
| $\Delta$ Delta   | change in something, (eg. $\Delta\lambda$ )                 |
| $\delta$ Delta   | $\delta$ Cepheii (a variable star)                          |
| $\lambda$ Lambda | wavelength of light   |
| $\mu$ Mu         | micro = $10^{-6}$ ( $\mu\text{m}$ =micrometer)              |
| $\nu$ Nu         | frequency of light  |
| $\pi$ Pi         | 3.141... Area = $\pi r^2$                                   |
| $\rho$ Rho       | density (e.g.: $\rho_{\text{critical}}$ = Critical Density) |
| $\sigma$ Sigma   | Stephan-Boltzman Constant                                   |
| $\Omega$ Omega   | Cosmology constant = $\rho/\rho_{\text{critical}}$          |

**Pluralize Me!**

Words derived from other languages have interesting plurals, like medium (media), and cactus (cacti). Fill in the missing plurals to these astronomy terms.

| Singular  | Plural  |
|-----------|---------|
| Nebula    | Nebulae |
| Focus     | Foci    |
| Supernova | _____   |
| _____     | Nuclei  |
| Corona    | _____   |

- MM MM Good.**
- The Many Meanings of **M**
1. **M** Stars: faint type of star
  2.  **$M_V$**  : Absolute magnitude
  3.  **$m_V$**  : Apparent magnitude
  4. **m, mm** : meters, millimeters
  5. **M** : mass
  6.  **$M_{\text{Sun}}, M_o$**  : "Solar Mass" (eg.  $M_{\text{star}} = 10M_{\text{sun}}$ )
  7. **M** =mass lost in nuclear fusion and converted to energy ( $E=Mc^2$ )

Big Numbers & Scientific Notation

|   |            |                  |              |
|---|------------|------------------|--------------|
| $0.1 = 10^{-1}$                         | $1 = 10^0$ | $10 = 10^1$      | $100 = 10^2$ |
| $1,000 = 10^3$                          |            | (prefix: kilo-)  |              |
| $1,000,000 = 10^6 = \text{million}$     |            | (prefix: mega-)  |              |
| $1,000,000,000 = 10^9 = \text{billion}$ |            | (prefix: giga-)  |              |
| $0.01 = 10^{-2}$                        |            | (prefix: centi-) |              |
| $0.000001 = 10^{-6}$                    |            | (prefix: micro-) |              |

**What's the Diff?** Look up these similar sounding words in your glossary and write their meanings. A few are given.

- 1.) **Eclipse:** \_\_\_\_\_
- Ellipse:** Oval shape of planetary orbits
- Ecliptic:** \_\_\_\_\_
- Elliptical:** Shaped like an ellipse. Also, a type of galaxy
- 2.) **Angular:** \_\_\_\_\_
- Annular:** Like a ring, or annulus
- Annual:** \_\_\_\_\_
- 3) **Equator:** A line on Earth halfway between the North and South Pole
- Equator, Celestial:** \_\_\_\_\_
- Equinox:** One of 2 days each year with equal hours of day and night (from Latin: "equal night")
- Equant:** Part of Ptolemy's Geocentric model of the solar system.