

How big is that?

Diameter of hydrogen atom	1.06×10^{-8} cm
Diameter of the Moon	3.5×10^3 km
Diameter of the Earth	1.3×10^4 km
Diameter of the Sun	1.4×10^6 km
Diameter of the Milky Way galaxy	1.7×10^5 ly
Distance to the Moon	3.8×10^5 km
Distance to the Sun	1.5×10^8 km
Distance to the next nearest star	4 ly
Distance to the center of the Milky Way	2.7×10^4 ly
Distance to the nearest galaxy	1.7×10^5 ly
Mass of hydrogen atom	1.67×10^{-24} gm
Mass of the Moon	7.4×10^{25} gm
Mass of the Earth	6.0×10^{27} gm
Mass of the Sun	2.0×10^{33} gm ($1 M_{\odot}$)
Mass of the Milky Way galaxy	$5 \times 10^{10} M_{\odot}$
Luminosity of the Sun	3.8×10^{33} erg/s ($1 L_{\odot}$)
Luminosity of the largest stars	$10^5 L_{\odot}$
Luminosity of the Milky Way galaxy	$10^{10} L_{\odot}$
Luminosity of quasar 3C 273	$10^{12} L_{\odot}$
Earth's rotation period	8.64×10^4 s (1 day)
Moon's revolution period	28 days
Earth's revolution period	365.25 days (1 year)
Sun's revolution period within Milky Way	2.4×10^8 years
Age of the solar system	4.6×10^9 years
Expected life span of the Sun	1.5×10^{10} years
Age of the Universe	1.3×10^{10} years
Earth's equator rotation speed	0.47 km/s
Earth's revolution speed	30 km/s
Sun's speed within the Milky Way	220 km/s
Milky Way's speed within the local Universe	500 km/s

Typical lengths:

Normal star diameter	10^6 km
Distance between stars	a few ly
Normal galaxy diameter	10^5 ly
Distance between galaxies	10^6 ly

Typical masses:

Smallest star	$0.1 M_{\odot}$
Normal star	$1 M_{\odot}$
Giant star	$10 M_{\odot}$
Normal galaxy	$10^{10} - 10^{11} M_{\odot}$
Galaxy cluster	$10^{14} - 10^{15} M_{\odot}$

Typical luminosities:

Normal star	$1 L_{\odot}$
Giant star	$10^3 - 10^5 L_{\odot}$
Normal galaxy	$10^9 - 10^{10} L_{\odot}$
Quasar	$10^{12} - 10^{13} L_{\odot}$

Typical time spans:

Planetary revolution	1 year
Galaxy rotation	$10^7 - 10^9$ years
Life of giant stars	$10^6 - 10^9$ years
Life of normal star	10^{10} years

Typical speeds:

Planetary orbits	10 km/s
Stellar motion in galaxy	100 km/s
Between nearby galaxies	100 km/s

Other important constants:

$$1 \text{ ly} = 9.46 \times 10^{12} \text{ km} = 9.46 \times 10^{17} \text{ cm}$$

$$1 \text{ km} = 10^5 \text{ cm}$$

$$1 \text{ hour} = 3600 \text{ seconds}$$

$$\pi = 3.14159265359$$

$$\text{Speed of light: } c = 2.99792458 \times 10^5 \text{ km/s} = 2.99792458 \times 10^{10} \text{ cm/s} = 1 \text{ ly/year}$$

$$1 \text{ Mly} = 10^6 \text{ ly}$$

$$1 \text{ erg} = 1 \text{ gm cm}^2/\text{s}^2$$

$$1 \text{ year} = 3.16 \times 10^7 \text{ seconds}$$

$$\text{Hubble's constant: } H_0 = 20 \text{ km}/(\text{sec Mly})$$

$$\text{Newton's gravitational constant: } G = 6.67 \times 10^{-8} \text{ cm}^3/(\text{gm s}^2)$$