

# How Big Is That?

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Diameter of hydrogen atom	$1.06 \times 10^{-8}$ cm	<b>Typical masses</b>	
Diameter of the Moon	$3.5 \times 10^3$ km	Smallest star	$0.08 M_{\odot}$
Diameter of the Earth	$1.3 \times 10^4$ km	Normal star	$1 M_{\odot}$
Diameter of the Sun	$1.4 \times 10^6$ km	Giant star	$10 M_{\odot}$
Diameter of the Milky Way	$1.7 \times 10^5$ ly	Normal galaxy	$10^{11} - 10^{12} M_{\odot}$
Distance to the Moon	$3.8 \times 10^5$ km	Galaxy cluster	$10^{14} - 10^{15} M_{\odot}$
Distance to the Sun	$1.5 \times 10^8$ km	<b>Typical luminosities</b>	
Distance to the nearest star	4.2 ly	Normal star	$1 L_{\odot}$
Distance to the center of the Milky Way	$2.8 \times 10^4$ ly	Giant star	$10^3 - 10^5 L_{\odot}$
Distance to the nearest galaxy	$1.7 \times 10^5$ ly	Normal galaxy	$10^9 - 10^{10} L_{\odot}$
Mass of hydrogen atom	$1.67 \times 10^{-24}$ g	Quasar	$10^{12} - 10^{13} L_{\odot}$
Mass of the Moon	$7.4 \times 10^{25}$ g	<b>Typical timespans</b>	
Mass of the Earth	$6.0 \times 10^{27}$ g	Planetary revolution	1 year
Mass of the Sun ( $1 M_{\odot}$ )	$2.0 \times 10^{33}$ g	Galaxy rotation	$10^7 - 10^9$ yr
Mass of the Milky Way	$3 \times 10^{12} M_{\odot}$	Life of giant stars	$10^6 - 10^9$ yr
Luminosity of the Sun ( $1 L_{\odot}$ )	$3.8 \times 10^{33}$ erg/s	Life of normal stars	$10^{10}$ yr
Luminosity of the largest stars	$10^5 L_{\odot}$	<b>Typical speeds</b>	
Luminosity of the Milky Way	$2 \times 10^{10} L_{\odot}$	Planetary orbits	10 km/s
Luminosity of quasar 3C 273	$10^{12} L_{\odot}$	Stellar motion in galaxies	100 km/s
Earth's rotation period (1 day)	$8.64 \times 10^4$ s	Between nearby galaxies	100 km/s
Moon's revolution period	27.322 days	<b>Other important constants</b>	
Earth's revolution period (1 year)	365.25 days	1 ly = $9.46 \times 10^{12}$ km	1 Mly = $10^6$ ly
Sun's revolution period within Milky Way	$2.4 \times 10^8$ yr	1 ly = $9.46 \times 10^{17}$ cm	1 km = $10^5$ cm
Age of the Solar System	$4.6 \times 10^9$ yr	1 hour = 3600 s	
Expected life span of the Sun	$1.5 \times 10^{10}$ yr	1 year = $3.16 \times 10^7$ s	
Age of the Universe	$1.4 \times 10^{10}$ yr	1 erg = 1 g cm <sup>2</sup> /s <sup>2</sup>	
Earth's equator rotation speed	0.47 km/s	$c = 2.99792458 \times 10^5$ km/s	Speed of light
Earth's revolution speed	30 km/s	$c = 2.99792458 \times 10^{10}$ cm/s	Speed of light
Sun's speed within the Milky Way	250 km/s	$c = 1$ ly/yr	Speed of light
Milky Way's speed within the local Universe	550 km/s	$G = 6.67 \times 10^{-8}$ cm <sup>3</sup> g <sup>-1</sup> s <sup>-2</sup>	<b>Gravitational constant</b>
<b>Typical lengths</b>		$H_0 = 20$ km/s/Mly	Hubble constant
Normal star diameter	$10^6$ km	$1/H_0 = 1.5 \times 10^{10}$ yr	Hubble time
Distance between stars	a few ly		
Normal galaxy diameter	$10^5$ ly		
Distance between galaxies	$10^6$ ly		