Appendix B | Physical and astronomical constants

Physical constants

speed of light	$c = 2.99792456 \times 10^{10}$ cm/s $= 2.99792456 \times 10^{5}$ km/s
gravitation constant	$G = 6.6732 \times 10^{-8}$ dyne cm^{2}g^2
Boltzmann constant	$k = 1.3806 \times 10^{-16}$ erg/K
Planck's constant	$h = 6.6262 \times 10^{-27}$ erg s
Stefan–Boltzmann constant	$\sigma = 5.6696 \times 10^{-5}$ erg/cm^2 K^4 s
Wien displacement constant	$\lambda_{max}T = 2.89789 \times 10^{-1}$ cm K
Rydberg constant	$R = 1.097373 \times 10^{5}$/cm
Avogadro's number	$N_A = 6.022169 \times 10^{23}$/mol
atomic mass unit	$u = 1.66053 \times 10^{-24}$ g
mass of proton	$m_p = 1.6726 \times 10^{-24}$ g
mass of neutron	$m_n = 1.6749 \times 10^{-24}$ g
mass of electron	$m_e = 9.1096 \times 10^{-28}$ g
mass of hydrogen atom	$m_H = 1.6735 \times 10^{-24}$ g
charge of proton	$e = 4.8033 \times 10^{-10}$ esu
Bohr radius	$a_0 = 5.29177 \times 10^{-9}$ cm

Astronomical constants

astronomical unit	1 AU $= 1.4959789 \times 10^{13}$ cm $= 1.4959789 \times 10^{8}$ km
parsec	1 pc $= 3.0856 \times 10^{18}$ cm $= 3.0856 \times 10^{13}$ km $= 3.2615$ ly
light year	1 ly $= 9.4605 \times 10^{17}$ cm
solar mass	$M_\odot = 1.9891 \times 10^{33}$ g
solar radius	$R_\odot = 6.9598 \times 10^{10}$ cm $= 6.9598 \times 10^{5}$ km
solar luminosity	$L_\odot = 3.83 \times 10^{33}$ erg/s
Earth mass	$M_E = 5.977 \times 10^{27}$ g
Earth radius (equatorial)	$R_E = 6.37817 \times 10^{8}$ cm $= 6.37817 \times 10^{3}$ km
Earth–Moon distance	$R_{EM} = 3.84403 \times 10^{10}$ cm $= 3.84403 \times 10^{5}$ km
Moon mass	$M_M = 7.35 \times 10^{25}$ g
Moon radius	$R_M = 1.738 \times 10^{8}$ cm $= 1.738 \times 10^{3}$ km
galactic center–Sun distance	$R_0 = 8.5$ kpc
orbital speed of the Sun about the galactic center	$v_0 = 220$ km/s