

SPEED OF LIGHT

IN A VACUUM

$$c = 2.9998 \times 10^8 \text{ ms}^{-1}$$

ELECTRON

CHARGE

$$e = 1.602 \times 10^{-19} \text{ C}$$

# PLANCK'S CONSTANT

$$h = 6.63 \times 10^{-34} \text{ Js}$$

# BOLTZMANN'S CONSTANT

$$k_B = 1.38 \times 10^{-23} \text{ JK}^{-1}$$

# AVOGADRO'S NUMBER

$$N_A = 6.02 \times 10^{23} \text{ mol}^{-1}$$

# PERMITTIVITY OF FREE SPACE

$$\epsilon_0 = 8.85 \times 10^{-12} \text{ Fm}^{-1}$$

PERMEABILITY  
OF FREE  
SPACE

$$\mu_0 = 4\pi \times 10^{-7} \text{ Hm}^{-1}$$

# ATOMIC MASS UNIT

$$u = 1.660 \times 10^{-27} \text{ kg}$$

$$u = 931.3 \text{ MeV}/c^2$$



# PROTON MASS

$$m_p = 1.673 \times 10^{-27} \text{ kg}$$

$$m_p = 938.3 \text{ MeV}/c^2$$

# NEUTRON MASS

$$m_n = 1.675 \times 10^{-27} \text{ kg}$$

$$m_n = 939.6 \text{ MeV}/c^2$$

# ELECTRON MASS

$$m_e = 9.109 \times 10^{-31} \text{ kg}$$

$$m_e = 0.511 \text{ MeV}/c^2$$

# EARTH

$$M_{\oplus} = 5.974 \times 10^{24} \text{ kg}$$

$$R_{\oplus} = 6.378 \times 10^6 \text{ m}$$

$$1 \text{ AU} = 1.496 \times 10^{11} \text{ m}$$

$$L_{\odot} / 4\pi \text{ AU}^2 = 1368 \text{ W m}^{-2}$$

# MOON

$$M_m = 7.347 \times 10^{22} \text{ kg}$$

$$R_m = 1.738 \times 10^6 \text{ m}$$

$$r_{\oplus m} = 3.844 \times 10^8 \text{ m}$$

# GRAVITY

$$G = 6.67 \times 10^{-11} \text{ m}^3 \text{ kg}^{-1} \text{ s}^{-2}$$

$$g = 9.81 \text{ N kg}^{-1}$$

$$g_{\text{moon}} = 1.62 \text{ N kg}^{-1}$$

$$g_{\text{mars}} = 3.71 \text{ N kg}^{-1}$$

# SUN

$$M_{\odot} = 1.989 \times 10^{30} \text{ kg}$$

$$R_{\odot} = 6.960 \times 10^8 \text{ m}$$

$$L_{\odot} = 3.828 \times 10^{26} \text{ W}$$