

General Astronomy - Spring 2006
Equation Sheet

$$M = F_o/F_e \quad A = \frac{\pi d^2}{4} \quad \theta = \frac{\lambda}{d}$$

$$U = -\frac{3GM^2}{5R} \quad K = \frac{3MkT}{2m_H} \quad M = \frac{4}{3}\pi R^3 n M_H \quad M_J = 18M_\odot \sqrt{\frac{T^3}{n}}$$

$$d = 1/p \quad D = \theta d \quad F = ma \quad v = \frac{dx}{dt} \quad a = \frac{dv}{dt} \quad F = G \frac{M_1 M_2}{d^2}$$

$$E = K + U \quad K = \frac{1}{2}mv^2 \quad U = -\int F(x)dx \quad E = mc^2$$

$$\lambda \times f = c \quad E = hf \quad \lambda = \left[R_H \left(\frac{1}{n^2} - \frac{1}{m^2} \right) \right]^{-1} \quad \frac{V}{c} = \frac{\lambda_{obs} - \lambda_0}{\lambda_0}$$

$$K = \frac{3}{2}kT \quad \lambda = 2.9 \times 10^6 (\text{nm})/T(\text{K}) \quad F = L_{Sun}/4\pi D^2 \quad L = 4\pi R^2 \sigma T^4$$

$$\bar{L} = l\sqrt{n} \quad m_1 - m_2 = -2.5 \log \left(\frac{F_1}{F_2} \right) \quad \frac{F_1}{F_2} = 10^{(m_2 - m_1)/2.5}$$

$$M = m - 5 \log_{10} D + 5 \quad L = L_\odot \times 10^{(M_\odot - M_B)/2.5} \quad \frac{L}{L_\odot} \approx \left(\frac{M}{M_\odot} \right)^{3.5}$$

$$\frac{4\pi^2}{G(m_1 + m_2)} a^3 = P^2 \quad M_1 a_1 = M_2 a_2 \quad M_1 v_1 = M_2 v_2 \quad v = \frac{2\pi a}{P}$$

$$M_1 + M_2 = \frac{a^3}{P^2} \text{ for } M \text{ in } M_\odot, a \text{ in AU, and } P \text{ in years}$$

$$\frac{\text{Flux}_A}{\text{Flux}_B} = \frac{\text{Luminosity}_A}{\text{Luminosity}_B} \left(\frac{\text{Distance}_B}{\text{Distance}_A} \right)^2 \quad \text{Distance}_B = \text{Distance}_A \sqrt{\frac{\text{Flux}_A}{\text{Flux}_B}}$$

$$U = -\frac{3GM^2}{5R} \quad v = \sqrt{\frac{GM(r)}{r}} \quad M_J = 18M_\odot \sqrt{\frac{T^3}{n}} \text{ for } T \text{ in K and } n \text{ in cm}^{-3}$$

$$I = \frac{2}{5}MR^2 \quad L = \frac{4}{5}\pi MR^2\nu \quad \nu_f = \nu_i \left(\frac{R_i}{R_f}\right)^2 \quad P = 4\pi I\nu \frac{d\nu}{dt}$$

$$t' = t\sqrt{1 - \frac{v^2}{c^2}} \quad l' = \frac{l}{\sqrt{1 - \frac{v^2}{c^2}}}$$

$$\nu' = \nu\sqrt{1 - \frac{2GM}{Rc^2}} = \nu\sqrt{1 - \frac{R_S}{R}} \quad R_S = \frac{2GM}{c^2} = (2.95 \text{ km})\frac{M}{M_\odot}$$

$$v = Hd \quad \rho_C = \frac{3}{8\pi G}H^2 = 9.7 \times 10^{-27} \text{ kg m}^{-3} \quad \Omega_0 = \rho/\rho_C$$

$$\theta(\text{radians}) = 206265 \times \theta(\text{arcseconds})$$

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

$$h = 6.626068 \times 10^{-34} \text{ m}^2 \text{ kg s}^{-1}$$

$$c = 299792458 \text{ m/s}$$

$$R_H = 1.096878 \times 10^7 \text{ m}^{-1}$$

$$k = 1.38 \times 10^{-23} \text{ J/K} = 8.62 \times 10^{-5} \text{ eV/K}$$

$$\sigma = 5.67 \times 10^{-8} \text{ W m}^{-2} \text{ K}^{-4}$$

$$M_{Sun} = 1.99 \times 10^{30} \text{ kg} \quad R_{Sun} = 696,000 \text{ km} \quad T_{Sun} = 5,800 \text{ K}$$

$$L_{Sun} = 3.8 \times 10^{26} \text{ W} \quad M_V(Sun) = 4.83 \quad M_{Bol}(Sun) = 4.74$$

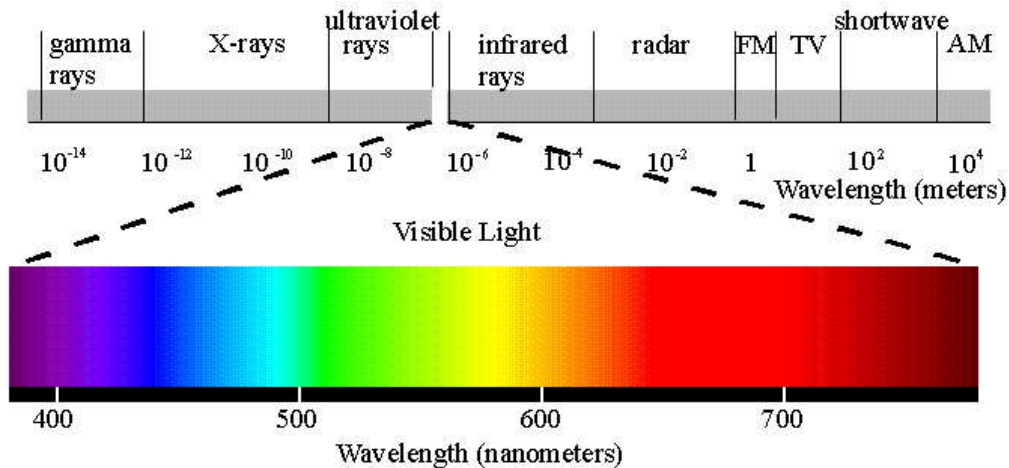
$$M_H = 1.6726 \times 10^{-27} \text{ kg}$$

$$M_{He} = 6.643 \times 10^{-27} \text{ kg}$$

$$M_{Earth} = 5.97 \times 10^{24} \text{ kg} \quad R_{Earth} = 6,378 \text{ km} \quad D_{Earth-Sun} = 1.496 \times 10^{11} \text{ m}$$

$$1 \text{ pc} = 3.086 \times 10^{16} \text{ m}$$

$$H = 71 \text{ km/s/Mpc}$$



[Table of Contents](#)

[Visual Stimulus](#)