

## Constants and Units

(to two significant digits)

|                           |                        |   |  |
|---------------------------|------------------------|---|--|
| Gravitational constant    | $G$                    | = | $6.7 \times 10^{-8} \text{ erg cm g}^{-2}$                             |
| Speed of light            | $c$                    | = | $3.0 \times 10^{10} \text{ cm s}^{-1}$                                 |
| Planck's constant         | $h$                    | = | $6.6 \times 10^{-27} \text{ erg s}$                                    |
|                           | $\hbar$                | = | $h/2\pi = 1.1 \times 10^{-27} \text{ erg s}$                           |
| Boltzmann's constant      | $k$                    | = | $1.4 \times 10^{-16} \text{ erg K}^{-1}$                               |
|                           |                        | = | $8.6 \times 10^{-5} \text{ eV K}^{-1}$                                 |
| Stefan-Boltzmann constant | $\sigma$               | = | $5.7 \times 10^{-5} \text{ erg cm}^{-2} \text{ s}^{-1} \text{ K}^{-4}$ |
| Radiation constant        | $a$                    | = | $4\sigma/c = 7.6 \times 10^{-15} \text{ erg cm}^{-3} \text{ K}^{-4}$   |
| Proton mass               | $m_p$                  | = | $1.7 \times 10^{-24} \text{ g}$  |
| Electron mass             | $m_e$                  | = | $9.1 \times 10^{-28} \text{ g}$  |
| Electron charge           | $e$                    | = | $4.8 \times 10^{-10} \text{ esu}$                                      |
| Electron volt             | 1 eV                   | = | $1.6 \times 10^{-12} \text{ erg}$                                      |
| Thomson cross section     | $\sigma_T$             | = | $6.7 \times 10^{-25} \text{ cm}^2$                                     |
| Wien's Law                | $\lambda_{\text{max}}$ | = | $2900 \text{ \AA } 10^4 \text{ K}/T$                                   |
|                           | $h\nu_{\text{max}}$    | = | $2.4 \text{ eV } T/10^4 \text{ K}$                                     |
| Ångstrom                  | 1 Å                    | = | $10^{-8} \text{ cm}$   |
| Solar mass                | $M_{\odot}$            | = | $2.0 \times 10^{33} \text{ g}$   |
| Solar luminosity          | $L_{\odot}$            | = | $3.8 \times 10^{33} \text{ erg s}^{-1}$                                |
| Solar radius              | $r_{\odot}$            | = | $7.0 \times 10^{10} \text{ cm}$  |
| Solar distance            | $d_{\odot}$            | = | $1 \text{ AU} = 1.5 \times 10^{13} \text{ cm}$                         |
| Jupiter mass              | $M_J$                  | = | $1.9 \times 10^{30} \text{ g}$   |
| Jupiter radius            | $r_J$                  | = | $7.1 \times 10^9 \text{ cm}$   |
| Jupiter distance          | $d_J$                  | = | $5 \text{ AU} = 7.5 \times 10^{13} \text{ cm}$                         |
| Earth mass                | $M_{\oplus}$           | = | $6.0 \times 10^{27} \text{ g}$   |
| Earth radius              | $r_{\oplus}$           | = | $6.4 \times 10^8 \text{ cm}$   |
| Moon mass                 | $M_{\text{moon}}$      | = | $7.4 \times 10^{25} \text{ g}$   |
| Moon radius               | $r_{\text{moon}}$      | = | $1.7 \times 10^8 \text{ cm}$   |
| Moon distance             | $d_{\text{moon}}$      | = | $3.8 \times 10^{10} \text{ cm}$  |
| Astronomical unit         | 1 AU                   | = | $1.5 \times 10^{13} \text{ cm}$  |
| Parsec                    | 1 pc                   | = | $3.1 \times 10^{18} \text{ cm} = 3.3 \text{ l.y.}$                     |
| Year                      | 1 yr                   | = | $3.15 \times 10^7 \text{ s}$   |