Constants and Units (to two significant digits)

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

Speed of sound: $v_c = \sqrt{dP/d\rho}$
Stefan-Boltzmann Law: $f = \sigma T^4, \qquad U = aT^4, \qquad P = \frac{1}{3}U = \frac{1}{3}aT^4$
Mean free path: $\bar{l} = 1/n\sigma$
Collision probability per target: $dP = n\sigma dx$ Collision rate per target: $f = n\sigma v$
Ideal gas law: $P = \rho kT/\bar{m}$
Virial theorem for non-rel. ideal gas in hydrostatic eq.: $E_{tot} = -E_{th} = \frac{1}{2}E_{gr} = -\frac{3}{2}\bar{P}V$
Hydrogen spectrum: $\epsilon(n_1, n_2) = 13.6\text{eV}(\frac{1}{n_1^2} - \frac{1}{n_2^2}), \qquad \lambda(n_1, n_2) = 911.5\text{Å}/(\frac{1}{n_1^2} - \frac{1}{n_2^2})$
Schwarzschild radius: $R_s = \frac{2GM}{c^2}$
Gravitational redshift: $\frac{\lambda_{obs}}{\lambda_e} = (1 - R_s/r)^{-\frac{1}{2}}$
Relativistic Doppler shift: $\frac{\lambda_{obs}}{\lambda_e} = \frac{1+\beta\cos\theta}{\sqrt{1-\beta^2}} \rightarrow 1 + \frac{v\cos\theta}{c}$ (for $v << c$)
Cosmological redshift: $\frac{\lambda_{obs}}{\lambda_e} = 1 + z = R(t_{obs})/R(t_e)$