

## Constants and Conversions

<b>Standard Gravitational Acceleration (<math>g=M_e G/R_e^2</math>)</b>	$9.8 \text{ m/s}^2 = 32.2 \text{ ft/s}^2$	<b>Coulomb Law Constant (<math>k_e = 1/4\pi\epsilon_0</math>)</b>	$8.99 \times 10^9 \text{ N}\cdot\text{m}^2/\text{C}^2$
<b>Universal Gravitational Constant (G)</b>	$6.67 \times 10^{-11} \text{ N}\cdot\text{m}^2/\text{kg}^2$	<b>Electron Charge</b> <b>Proton Charge</b>	$-1.60 \times 10^{-19} \text{ C}$ $+1.60 \times 10^{-19} \text{ C}$
<b>Proton Mass (<math>m_p</math>)</b>	$1.673 \times 10^{-27} \text{ kg}$	<b>Bohr Radius (<math>a_0</math>)</b>	$5.29 \times 10^{-11} \text{ m}$
"	$938.272 \text{ MeV}/c^2$	<b>Rydberg Constant (<math>R_H</math>)</b>	$1.097 \times 10^7 \text{ m}^{-1}$
"	$1.007276 \text{ u}$	<b>Hydrogen Ground State Energy</b>	$-13.6 \text{ eV}$
<b>Neutron Mass (<math>m_n</math>)</b>	$1.675 \times 10^{-27} \text{ kg}$	<b>Hydrogen Atomic Mass (<math>m_H</math>)</b>	$1.007825 \text{ u}$
"	$939.566 \text{ MeV}/c^2$	<b>Speed of Light (c, vacuum)</b>	$3.00 \times 10^8 \text{ m/s}$
"	$1.008665 \text{ u}$	<b>Planck's Constant (h)</b>	$6.63 \times 10^{-34} \text{ J}\cdot\text{s}$
<b>Electron Mass (<math>m_e</math>)</b>	$9.110 \times 10^{-31} \text{ kg}$	<b>Boltzmann's Constant (<math>k_B</math>)</b>	$1.38 \times 10^{-23} \text{ J/K}$
"	$0.511 \text{ MeV}/c^2$	<b>Universal Gas Constant (R)</b>	$8.31 \text{ J}/(\text{mol}\cdot\text{K})$
"	$0.000549 \text{ u}$	<b>Density of air at sea level (<math>\rho_0</math>)</b>	$1.21 \text{ kg/m}^3$
		<b>Avogadro's Number (<math>N_A</math>)</b>	$6.02 \times 10^{23} (\text{mol})^{-1}$

### CELESTIAL QUANTITIES

Body	Mass (kg)	Mean Radius (m)	Distance from Sun (m)
Venus	$4.88 \times 10^{24}$	$6.06 \times 10^6$	$1.08 \times 10^{11}$
Earth	$5.98 \times 10^{24}$	$6.37 \times 10^6$	$1.50 \times 10^{11}$
Mars	$6.42 \times 10^{23}$	$3.37 \times 10^6$	$2.28 \times 10^{11}$
Jupiter	$1.90 \times 10^{27}$	$6.99 \times 10^7$	$7.78 \times 10^{11}$
Moon	$7.36 \times 10^{22}$	$1.74 \times 10^6$	
Sun	$1.99 \times 10^{30}$	$6.96 \times 10^8$	

### CONVERSIONS

1 mi/hour	=	0.447 m/s	angstrom ( $\text{\AA}$ )	=	$10^{-10}$
1 m	=	3.28 ft	pico (p)	=	$10^{-12}$
1 mile	=	1.609 km	nano (n)	=	$10^{-9}$
1 liter	=	$10^{-3} \text{ m}^3$	micro ( $\mu$ )	=	$10^{-6}$
1 eV	=	$1.6 \times 10^{-19} \text{ J}$	milli (m)	=	$10^{-3}$
1 u (a.m.u.)	=	$931.5 \text{ MeV}/c^2$	kilo (k)	=	$10^3$
1 u	=	$1.661 \times 10^{-27} \text{ kg}$	mega (M)	=	$10^6$
1 atm	=	$1.013 \times 10^5 \text{ Pa}$	giga (G)	=	$10^9$

(Tables courtesy Department of Physics, United States Air Force Academy.)