

Constants

Atomic

Plank's Constant	$h = 6.626 \times 10^{-34} Js$ $\hbar = \frac{h}{2\pi} = 6.582 \times 10^{-22} MeVs$
Bohr Magneton	$\mu_B = \frac{e\hbar}{2m_e} = 0.58 \times 10^{-4} eVT^{-1}$
Nuclear magneton	$\mu_N = \frac{e\hbar}{2m_p} = 3.15 \times 10^{-8} eVT^{-1}$
Electron g-factor	$g_e = \left(\frac{2\mu_e}{\mu_B} \right) = 2.0023$
Proton gyromagnetic ratio	$\gamma_p = 2.67 \times 10^8 s^{-1}T^{-1}$

Compton Wavelengths

Electron	$\lambda_{c,e} = 2.426 \times 10^{-12} m$
Neutron	$\lambda_{c,n} = 1.32 \times 10^{-15} m$
Proton	$\lambda_{c,p} = 1.324 \times 10^{-15} m$

Energies

Rydberg Energy (Hydrogen)	$E_R = 13.6eV$
Electronic Charge	$e = 1.602 \times 10^{-19} C$
Electron Volt	$1eV = 1.602 \times 10^{-19} J$

Magnetic Moments

Electron	$\mu_e = 9.284 \times 10^{-24} JT^{-1}$
Neutron	$\mu_n = 9.66 \times 10^{-27} JT^{-1}$
Proton	$\mu_p = 1.411 \times 10^{-26} JT^{-1}$

Masses

Electron	$m_e = 9.11 \times 10^{-31} kg = 0.511 MeV c^{-2}$
Proton	$m_p = 1.6726 \times 10^{-27} kg = 938.2 MeV c^{-2}$
Neutron	$m_n = 1.6749 \times 10^{-27} kg$
Atomic Mass Unit	$u = \frac{m_{12}C}{12} = 1.66 \times 10^{-27} kg = 931.5 MeV c^{-2}$
Avogadro's Number	$N_A = 6.02 \times 10^{23} mol^{-1}$

Sizes

Bohr Radius (Hydrogen)	$a_o = 0.53A = 0.053nm$
Electron Radius (Classical) ($\alpha^2 a_o$)	$r_e = 2.8179 \times 10^{-15} m$
Thompson cross-section	$\sigma_T = \frac{8\pi}{3} r_e^2 = 6.652 \times 10^{-24} m$

Constants

Astronomy

Earth → Sun	$1AU = 1.5 \times 10^{11} m = 8-9 \text{ light minutes}$
Earth → Moon	1.3 light seconds
Earth → Venus	3 Light minutes
Earth → Pluto	5-6 Light Hours
Earth → Nearest Star	A few Light Years
Earth → Centre of Galaxy	30,000 Light Years
Earth → Nearest Galaxy	2×10^6 Light Years
Earth → Edge of the Visible Universe	10^{10} Light Years
Typical size of galaxy	10^5 Light Years
Mass of Sun	$1M_{\odot} = 2 \times 10^{30} kg$
Mass of Galaxy	$\approx 10^{11} M_{\odot} \approx 10^{32} kg$

Electromagnetic

Electric Field Constant	$\epsilon_0 = 8.859 \times 10^{-12} Fm^{-1}$
Permeability of Vacuum	$\mu_0 = 4\pi \times 10^{-7} Na^{-2}$

Mathematics

e	2.7182
π	3.1415926854

Mechanics

Speed of Light	$c = 299,792,458 ms^{-1}$
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