Fundamental constants

name	symbol	value
speed of light	c	$2.998 \times 10^{8}\,\mathrm{m\,s^{-1}}$
permeability of free space	μ_0	$4\pi \times 10^{-7}\,\mathrm{H\,m^{-1}}$
permittivity of free space	ϵ_0	$8.854 \times 10^{-12}\,\mathrm{F\,m^{-1}}$
electronic charge	e	$1.602 \times 10^{-19}\,\mathrm{C}$
Avogadro's number	N_0	$6.022 \times 10^{23}\,\mathrm{mol^{-1}}$
electron rest mass	m_e	$9.110 \times 10^{-31}\,\mathrm{kg}$
proton rest mass	m_p	$1.673 \times 10^{-27}\,\mathrm{kg}$
neutron rest mass	m_n	$1.675 \times 10^{-27}\,\mathrm{kg}$
Faraday's constant	F	$9.649 \times 10^{-4}\,\mathrm{C\,mol^{-1}}$
Planck's constant	h	$6.626 \times 10^{-34}\,\mathrm{J\,s}$
fine structure constant	α	7.297×10^{-3}
electron charge to mass ratio	e/m_e	$1.759 \times 10^{11}\,\mathrm{C\,kg^{-1}}$
quantum/charge ratio	h/e	$4.136 \times 10^{-15}\,\mathrm{J\,s\,C^{-1}}$
electron Compton wavelength	λ_e	$2.426 \times 10^{-12}\,\mathrm{m}$
proton Compton wavelength	λ_p	$1.321 \times 10^{-15}\,\mathrm{m}$
Rydberg constant	R	$1.097 \times 10^{7}\,\mathrm{m^{-1}}$
Bohr radius	a_0	$5.292 \times 10^{-11}\,\mathrm{m}$
Bohr magneton	μ_B	$9.274 \times 10^{-24}\,\mathrm{J\,T^{-1}}$
nuclear magneton	μ_N	$5.051 \times 10^{-27}\,\mathrm{J\,T^{-1}}$
proton magnetic moment	μ_p	$1.411 \times 10^{-26}\,\mathrm{J\,T^{-1}}$
universal gas constant	R	$8.314\,\mathrm{J\,K^{-1}\,mol^{-1}}$
normal volume of ideal gas	–	$2.241 \times 10^{-2}\,\mathrm{m^3\,mol^{-1}}$
Boltzmann constant	k_B	$1.381 \times 10^{-23}\,\mathrm{J\,K^{-1}}$
First radiation constant $2\pi hc^2$	c_1	$3.742 \times 10^{-16}\,\mathrm{W\,m^2}$
Second Radiation constant hc/k_B	c_2	$1.439 \times 10^{-2}\,\mathrm{m\,K}$
Wien displacement constant	b	$2.898 \times 10^{-3}\,\mathrm{m\,K}$
Stefan-Boltzmann constant	σ	$5.670 \times 10^{-8}\,\mathrm{W\,m^{-2}\,K^{-4}}$
gravitational constant	G	$6.673 \times 10^{-11}\,\mathrm{m^3\,kg^{-1}\,s^{-2}}$
impedance of free space	Z_0	$3.767 \times 10^{2}\,\Omega$

Derived units

quantity	dimensions*	derived unit
energy	ML^2T^{-2}	J
force	MLT^{-2}	N
frequency	T^{-1}	Hz
gravitational field strength	LT^{-2}	$\mathrm{N\,kg^{-1}}$
gravitational potential	L^2T^{-2}	$\mathrm{J\,kg^{-1}}$
power	ML^2T^{-3}	W
entropy	ML^2T^{-2}	$\mathrm{J\,K^{-1}}$
heat	ML^2T^{-2}	J
capacitance	$M^{-1}L^{-2}T^4I^2$	F
charge	IT	C
current	I	A
electric dipole moment	LTI	C m
electric displacement	$L^{-2}TI$	$\mathrm{C\,m^{-2}}$
electric polarisation	$L^{-2}TI$	$\mathrm{C\,m^{-2}}$
electric field strength	$MLT^{-3}I^{-1}$	$\mathrm{V\,m^{-1}}$
electric (displacement) flux	TI	C
electric potential	$ML^2T^{-3}I^{-1}$	V
inductance	$ML^2T^{-2}I^{-2}$	H
magnetic dipole moment	L^2I	$\mathrm{A\,m^2}$
magnetic field strength	$L^{-1}I$	$\mathrm{A\,m^{-1}}$
magnetic flux	$ML^2T^{-2}I^{-1}$	Wb
magnetic induction	$MT^{-2}I^{-1}$	T
magnetisation	$L^{-1}I$	$\mathrm{A\,m^{-1}}$
permeability	$MLT^{-2}I^{-2}$	$\mathrm{H\,m^{-1}}$
permittivity	$M^{-1}L^{-3}T^4I^2$	$\mathrm{F\,m^{-1}}$
resistance	$ML^2T^{-3}I^{-2}$	Ω
resistivity	$ML^3T^{-3}I^{-2}$	$\Omega\,\mathrm{m}$

* M = mass, L = length, T = time, I = current