

Fundamental Physical Constants — Frequently used constants

| Quantity | Symbol | Value | Unit | Relative std. uncert. u_r |
|--|---------------|---|---|-----------------------------|
| speed of light in vacuum | c, c_0 | 299 792 458 | m s^{-1} | (exact) |
| magnetic constant | μ_0 | $4\pi \times 10^{-7}$ $= 12.566\,370\,614\dots \times 10^{-7}$ | N A^{-2} | (exact) |
| electric constant $1/\mu_0 c^2$ | ϵ_0 | $8.854\,187\,817\dots \times 10^{-12}$ | F m^{-1} | (exact) |
| Newtonian constant of gravitation | G | $6.6742(10) \times 10^{-11}$ | $\text{m}^3 \text{kg}^{-1} \text{s}^{-2}$ | 1.5×10^{-4} |
| Planck constant | h | $6.626\,0693(11) \times 10^{-34}$ | J s | 1.7×10^{-7} |
| $h/2\pi$ | \hbar | $1.054\,571\,68(18) \times 10^{-34}$ | J s | 1.7×10^{-7} |
| elementary charge | e | $1.602\,176\,53(14) \times 10^{-19}$ | C | 8.5×10^{-8} |
| magnetic flux quantum $h/2e$ | Φ_0 | $2.067\,833\,72(18) \times 10^{-15}$ | Wb | 8.5×10^{-8} |
| conductance quantum $2e^2/h$ | G_0 | $7.748\,091\,733(26) \times 10^{-5}$ | S | 3.3×10^{-9} |
| electron mass | m_e | $9.109\,3826(16) \times 10^{-31}$ | kg | 1.7×10^{-7} |
| proton mass | m_p | $1.672\,621\,71(29) \times 10^{-27}$ | kg | 1.7×10^{-7} |
| proton-electron mass ratio | m_p/m_e | 1836.152 672 61(85) | | 4.6×10^{-10} |
| fine-structure constant $e^2/4\pi\epsilon_0\hbar c$ | α | $7.297\,352\,568(24) \times 10^{-3}$ | | 3.3×10^{-9} |
| inverse fine-structure constant | α^{-1} | 137.035 999 11(46) | | 3.3×10^{-9} |
| Rydberg constant $\alpha^2 m_e c/2h$ | R_∞ | 10 973 731.568 525(73) | m^{-1} | 6.6×10^{-12} |
| Avogadro constant | N_A, L | $6.022\,1415(10) \times 10^{23}$ | mol^{-1} | 1.7×10^{-7} |
| Faraday constant $N_A e$ | F | 96 485.3383(83) | C mol^{-1} | 8.6×10^{-8} |
| molar gas constant | R | 8.314 472(15) | $\text{J mol}^{-1} \text{K}^{-1}$ | 1.7×10^{-6} |
| Boltzmann constant R/N_A | k | $1.380\,6505(24) \times 10^{-23}$ | J K^{-1} | 1.8×10^{-6} |
| Stefan-Boltzmann constant $(\pi^2/60)k^4/\hbar^3 c^2$ | σ | $5.670\,400(40) \times 10^{-8}$ | $\text{W m}^{-2} \text{K}^{-4}$ | 7.0×10^{-6} |
| Non-SI units accepted for use with the SI | | | | |
| electron volt: $(e/C) \text{ J}$ | eV | $1.602\,176\,53(14) \times 10^{-19}$ | J | 8.5×10^{-8} |
| (unified) atomic mass unit $1 \text{ u} = m_u = \frac{1}{12} m(^{12}\text{C})$ $= 10^{-3} \text{ kg mol}^{-1}/N_A$ | u | $1.660\,538\,86(28) \times 10^{-27}$ | kg | 1.7×10^{-7} |