

E Table of physical and astronomical constants

(This Appendix is for reference only. It is not part of the Universal System of Units Standard.)

Finally, fundamental physical constants, material constants, and astronomical constants expressed by means of the Universal System of Units Standard are presented.¹⁷

* a constant that is entirely linked to the fine structure constant.

Table 6: Fundamental physical constants

Characteristic impedance in a vacuum	1		Ω_n/rad^2	$(\sqrt{\mu_0/\epsilon_0})$
Avogadro constant	1		mol_n^{-1}	(N_A)
Rydberg constant	1	$\times 10_{(12)}^6$	Ω_1/m_u	(R_∞)
Speed of light in a vacuum	1	$\times 10_{(12)}^8$	m_u/s_u	(c_0)
Quantum of action	1	$\times 10_{(12)}^{-26}$	$\mathbf{J}_u s_u$	(\hbar)
Boltzmann constant	1	$\times 10_{(12)}^{-18}$	$\mathbf{J}_u/\mathbf{K}_u$	(k_B)
Gas constant	1	$\times 10_{(12)}^4$	$\mathbf{J}_u/(\text{mol}_u \mathbf{K}_u)$	(R)
Atomic mass unit	1.0009_051B_6	$\times 10_{(12)}^{-20}$	g_u	$(m^{12}C/12)$
Bohr radius	1.005B_859A_5	$\times 10_{(12)}^{-9}$	m_u	$*(\alpha\Omega_1/4\pi R_\infty)$
Fine structure constant	0.0107_3994_38	$_{(12)}$		$*(\alpha = e^2\Omega_n/\hbar)$
Charge of an electron	1.0374_43B6_4	$\times 10_{(12)}^{-14}$	C_u	$*(\sqrt{\alpha\hbar/\Omega_n})$
Mass of an electron	0.B469_2178_0	$\times 10_{(12)}^{-23}$	g_u	$*(m_e = 4\pi R_\infty \hbar/\Omega_1 \alpha^2 c_0)$
Classical electron radius	1.1368_3609_A	$\times 10_{(12)}^{-11}$	m_u	$*(\alpha^3\Omega_1/4\pi R_\infty)$
Bohr magneton	0.659A_AB66	$\times 10_{(12)}^{-17}$	$A_u m_u^2$	$*(e\hbar/2m_e)$
Proton/electron mass ratio	1090.19B5_78	$_{(12)}$		(m_p/m_e)
Gravitational constant	2A.B33B	$\times 10_{(12)}^{34}$	N_u	$(N_G = c_0^4/G)$
Half the value of the Planck length	0.BA70BB	$\times 10_{(12)}^{-27}$	m_u	$(l_P = (1/2)\sqrt{G\hbar/c_0^3\alpha})$
Planck mass	5A.B223	$\times 10_{(12)}^{-8}$	g_u	$(\sqrt{\hbar c_0/G})$
Stephan-Boltzmann constant	0.1B82_B282	$\times 10_{(12)}^{-6}$	$W_u/(m_u^2 K_u^4)$	$(\pi^2 k_B^4/60\hbar^3 c_0^2)$
Josephson constant	0.3ABA_1394	$\times 10_{(12)}^{12}$	$\Omega_1/(C_u \Omega_n)$	$*(K_J = 2e/h = (\Omega_1/\pi)\sqrt{\alpha/\hbar\Omega_n})$
von Klitzing constant	5.B903_2B9B	$\times 10_{(12)}^2$	Ω_n/Ω_1	$*(R_K = h/e^2 = 2\pi\Omega_n/\Omega_1\alpha)$

¹⁷ This table doesn't take account of the latest (1998) values of the constants. If you are interested in these constants, see <http://physics.nist.gov/constants>.