

# Physical Constants

$c$	2.997925	$\times 10^8$	$\text{m s}^{-1}$	Speed of light in vacuum
$G$	6.67430	$\times 10^{-11}$	$\text{m}^3 \text{kg}^{-1} \text{s}^{-2}$	Gravitational constant
$h$	6.626070	$\times 10^{-34}$	$\text{J s}$	Planck constant
$e$	1.602177	$\times 10^{-19}$	$\text{C}$	Elementary charge
$\hbar$	1.052572	$\times 10^{-34}$	$\text{J s}$	Reduced Planck constant
$k$	1.380649	$\times 10^{-23}$	$\text{J K}^{-1}$	Boltzmann constant
$\mu_0$	1.256637	$\times 10^{-6}$	$\text{N A}^{-2}$	Vacuum permeability
$\varepsilon_0$	8.854188	$\times 10^{-12}$	$\text{F m}^{-1}$	Vacuum permittivity
$\sigma$	5.670374	$\times 10^{-8}$	$\text{W m}^{-2} \text{K}^{-4}$	Stefan-Boltzmann constant
$m_e$	9.109384	$\times 10^{-31}$	$\text{kg}$	Electron mass
	0.510999		$\text{MeV c}^{-2}$	
$m_p$	1.672622	$\times 10^{-27}$	$\text{kg}$	Proton mass
	938.2721		$\text{MeV c}^{-2}$	
$m_n$	1.674927	$\times 10^{-27}$	$\text{kg}$	Neutron mass
	939.5654		$\text{MeV c}^{-2}$	
$N_A$	6.022141	$\times 10^{23}$	$\text{mol}^{-1}$	Avogadro constant
$R$	8.314463		$\text{J mol}^{-1} \text{K}^{-1}$	Gas constant
$a_0$	5.291772	$\times 10^{-11}$	$\text{m}$	Bohr radius
$R_\infty$	1.097373	$\times 10^7$	$\text{m}^{-1}$	Rydberg constant
$b_\lambda$	2.897772	$\times 10^{-3}$	$\text{m K}$	Wien's displacement constant
$b_\nu$	5.878926	$\times 10^{10}$	$\text{Hz K}$	
$a$	7.565767	$\times 10^{-16}$	$\text{J m}^{-3} \text{K}^{-4}$	Radiation constant
$\alpha$	7.297353	$\times 10^{-3}$		Fine structure constant
$\sigma_e$	6.652459	$\times 10^{-29}$	$\text{m}^2$	Thomson cross section
$\mu_B$	9.274010	$\times 10^{-27}$	$\text{J T}^{-1}$	Bohr magneton
$r_e$	2.817940	$\times 10^{-15}$	$\text{m}$	Classical electron radius
$g$	9.80665		$\text{m s}^{-2}$	Standard gravity on Earth
atm	1.01325	$\times 10^5$	$\text{Pa}$	Standard atmosphere

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All values are nominal 2023 CODATA or IAU recommendations.

# Astronomical Constants

AU	1.495979	$\times 10^{11}$	m	Astronomical Unit
ly	9.460730	$\times 10^{15}$	m	Light year
pc	3.085678	$\times 10^{16}$	m	Parsec
yr	365.2563		days	Sidereal year
$M_{\odot}$	1.988416	$\times 10^{30}$	kg	Solar mass
$R_{\odot}$	6.957	$\times 10^8$	m	Solar radius
$L_{\odot}$	3.828	$\times 10^{26}$	W	Solar luminosity
$T_{\odot, \text{eff}}$	5772		K	Solar effective temperature
$M_{\odot, \text{V}}$	4.83			Solar magnitude
$M_{\odot, \text{bol}}$	4.75			
$m_{\odot, \text{V}}$	− 26.832			
$\alpha_{\odot}$	32′			Size of solar disc
$\mu_{\odot}$	$4\pi^2$		$\text{AU}^3 \text{yr}^{-2}$	Solar gravitational parameter
$M_{\oplus}$	5.9722	$\times 10^{24}$	kg	Earth mass
$R_{\oplus}$	6.3781	$\times 10^6$	m	Earth radius
$e_{\oplus}$	0.016709			Earth eccentricity
$\omega_{\oplus}$	283.324°			Earth's longitude of perihelion
$M_{\text{moon}}$	7.346	$\times 10^{22}$	kg	Moon mass
$R_{\text{moon}}$	1.7374	$\times 10^6$	m	Moon radius
$d_{\text{E-M}}$	3.84399	$\times 10^8$	m	Earth–Moon distance
$m_{\text{moon, V}}$	12.74			magnitude of full moon
$\alpha_{\text{moon}}$	31′			Size of lunar disc
$M_{\text{J}}$	1.8982	$\times 10^{27}$	kg	Jupiter mass
$R_{\text{J}}$	6.9911	$\times 10^7$	m	Jupiter radius
$a_{\text{J}}$	5.2038		AU	Semi-major axis of Jupiter
$a_{\text{V}}$	0.7233		AU	Semi-major axis of Venus
$a_{\text{M}}$	1.5237		AU	Semi-major axis of Mars
$H_0$	70.1		$\text{km s}^{-1} \text{Mpc}^{-1}$	Hubble constant
$\kappa$	20.4955		arcsec	Abberation constant
$\varepsilon$	23° 26′ 21″			Obliquity of the ecliptic
$\zeta$	− 34′			Refraction at horizon
Jy	1	$\times 10^{-26}$	$\text{W m}^{-2} \text{Hz}^{-1}$	Jansky
$A$	15		$\text{km s}^{-1} \text{kpc}^{-1}$	Oort constants
$B$	20		$\text{km s}^{-1} \text{kpc}^{-1}$	

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