Astronomical constants

All values are given in SI Units; thus masses are expressed in kilograms and distances in meters.
The astronomical unit of time is a time interval of one day (1 D) equal to 86400 s. The astronomical unit of length (A) is that length for which the Gaussian gravitational constant (k) takes the value 0.017 202 098 95 $m^3\ kg^{-1}\ s^{-2}$. The astronomical unit of mass is the mass of the Sun (S). TT is the Terrestrial Time, TCG is the Geocentric Coordinate Time, TCB is the Barycentric Coordinate Time, TDB is the Barycentric Dynamical Time

Defining constants

Gaussian gravitational constant	$k = 0.017\ 202\ 098\ 95\ m^3\ kg^{-1}\ s^{-2}$
Speed of light	$c = 299792458\ m\ s^{-1}$
Mean ratio of the TT second to the TCG second	$1 - L_G = 1 - 6.969\ 290\ 134 \times 10^{-10}$
Mean ratio of the TCB second to the TDB second	$1 - L_B = 1 - 1.550\ 519\ 767\ 72 \times 10^{-8}$

Primary constants

Mean ratio of the TCB second to the TCG second	$1 - L_C = 1 - 1.480\ 826\ 867\ 41 \times 10^{-8}$
Light-time for unit distance (1 A)	$\tau_A = 499.004\ 786\ 3852\ s$
Equatorial radius of Earth	$a_e = 6.378\ 1366 \times 10^6\ m$
Potential of the geoid	$W_0 = 6.263\ 685\ 60 \times 10^7\ m^2\ s^{-2}$
Dynamical form-factor for Earth	$J_2 = 0.001\ 082\ 6359$
Flattening factor for the Earth	$f = 1/298.256\ 42$
	$1/f = 0.003\ 352\ 8197$
Geocentric gravitational constant	$GE = 3.986\ 004\ 391 \times 10^{14}\ m^3\ s^{-2}$
Constant of gravitation	$G = 6.673\ 84 \times 10^{-11}\ m^3\ kg^{-1}\ s^{-2}$
Ratio of mass of Moon to that of Earth	$\mu = 0.01230002$
	$1/\mu = 81.300587$
General precession in longitude, per Julian century, at standard epoch J2000	$\rho = 5029.796\ 195''$
Obliquity of the ecliptic at standard epoch J2000	$\varepsilon = 23°26'\ 21.406''$

Derived constants

Constant of nutation at standard epoch J2000	$N = 9.205\ 2331''$
Astronomical unit of distance ($A = c \cdot \tau_A$)	$A = 149\ 597\ 870\ 691\ m$
Solar parallax ($\pi_a = \arcsin(a_e/A)$)	$\pi_a = 8.794\ 1433''$
Constant of aberration for standard epoch J2000	$\kappa = 20.495\ 52''$
Heliocentric gravitational constant ($GS = A^3k^2/D^2$)	$GS = 1.327\ 2440 \times 10^{20}\ m^3\ s^{-2}$
Ratio of mass of Sun to that of the Earth (S/E) = (GS)/(GE))	$S/E = 332\ 946.050\ 895$
Ratio of mass of Sun to that of Earth + Moon	$(S/E)/(1 + \mu) = 328\ 900.561\ 400$
Mass of the Sun (S = (GS)/G)	$S = 1.9818 \times 10^{30}\ kg$

Ratios of mass of Sun to masses of the planets and Pluto

Mercury	6 023 600
Venus	408 523.71
Earth + Moon	328 900.561 400
Mars	3 098 708
Jupiter	1047.3486
Saturn	3497.898
Uranus	22 902.98
Neptune	19 412.24
Pluto	135 200 000

Other constants

Parsec (pc = A/tan(1"))	$pc = 3.085\ 677\ 581\ 28 \times 10^{16}\ m$
Light-year (ly = 365.25 $D \cdot c$)	$ly = 9.460\ 730\ 472\ 5808 \times 10^{15}\ m$
Hubble constant	$H_0 = 70.1\ km\ s^{-1}\ Mpc^{-1}$
Solar luminosity	$L_a = 3.939 \times 10^{26}\ W$
	$= 2.107 \times 10^{-15}\ S/D$