

## Constants

### *Physical constants*

The astronomical convention is to use cgs!

Symbol	Description	SI		cgs	
		Value	Unit	Value	Unit
$c$	Speed of light	2.9979 (8)	$\text{m s}^{-1}$	2.9979 (10)	$\text{cm}^{-1} \text{s}^{-1}$
$h$	Planck's constant	6.6261(-34)	J s	6.6261(-27)	erg s
$k$	Boltzmann's constant	1.3807(-23)	J/K	1.3807(-16)	erg/K
$\sigma_{\text{SB}}$	Stefan-Boltzmann constant	5.6704 (-8)	$\text{W m}^{-2} \text{K}^{-4}$	5.6704 (-5)	$\text{erg s}^{-1} \text{cm}^{-2} \text{K}^{-4}$
$G$	Gravitational constant	6.674 (-11)	$\text{N m}^{-2} \text{kg}^{-2}$	6.674 (-8)	$\text{dyn cm}^{-2} \text{g}^{-2}$
$N_{\text{A}}$	Avogadro's constant	6.0221 (23)	$\text{mol}^{-1}$	6.0221 (23)	$\text{mol}^{-1}$
$m_{\text{e}}$	Electron rest mass	9.1094(-31)	kg	9.1094(-28)	g
$m_{\text{p}}$	Proton rest mass	1.6726(-27)	kg	1.6726(-24)	g
$m_{\text{u}}$	Atomic mass unit	1.6605(-27)	kg	1.6605(-24)	g
$e$	Electron charge	1.602 (-19)	C	4.803 (-10)	esu
$\alpha$	Fine-structure constant	7.2974 (-3)		7.2974 (-3)	

Values  $a \times 10^b$  are given as  $a (b)$ .

### *Astronomical constants*

Symbol	Description	SI		cgs	
		Value	Unit	Value	Unit
AU	Astronomical unit	1.496 (11)	m	1.496 (13)	cm
ly	Light year	9.463 (15)	m	9.463 (17)	cm
pc	Parsec	3.086 (16)	m	3.086 (18)	cm
$\text{pc}^2$	Square parsec	9.5234 (32)	$\text{m}^2$	9.5234 (36)	$\text{cm}^2$
$\text{kpc}^2$	Square kiloparsec	9.5234 (38)	$\text{m}^2$	9.5234 (42)	$\text{cm}^2$
$L_{\odot}$	Solar luminosity	3.85 (26)	$\text{J s}^{-1}$	3.85 (33)	$\text{erg s}^{-1}$
$M_{\odot}$	Solar mass	1.989 (30)	kg	1.989 (33)	g
$R_{\odot}$	Solar radius	6.96 (8)	m	6.96 (10)	cm
$T_{\odot}$	Solar effective temperature	5.78 (3)	K	5.78 (3)	K
Jy	Jansky	1.00 (-26)	$\text{W m}^{-2} \text{Hz}^{-1}$	1.00 (-23)	$\text{erg s}^{-1} \text{cm}^{-2} \text{Hz}^{-1}$

Values  $a \times 10^b$  are given as  $a (b)$ .

## Conversion factors

### *Angles and lengths*

Unit/symbol	Description	SI		cgs	
		Value	Unit	Value	Unit
deg	degree	1.745 3 (−2)	rad	1.745 3 (−2)	rad
arcmin	arcminute	2.908 88 (−4)	rad	2.908 88 (−4)	rad
arcsec	arcsecond	4.848 1 (−6)	rad	4.848 1 (−6)	rad
sq deg	degree <sup>2</sup>	3.046 (−4)	sr	3.046 (−4)	sr
Å	angstrom	1.0 (−10)	m	1.0 (−8)	cm
μm	micrometer	1.0 (−6)	m	1.0 (−4)	cm

Values  $a \times 10^b$  are given as  $a (b)$ .

### *SI and cgs units*

Description	SI		cgs	
	Value	Unit	Value	Unit
Time	1	s	1	s
	1	year	3.16 (7)	s
Length	1	m	1 (2)	cm
Velocity	1	m s <sup>−1</sup>	1 (2)	cm s <sup>−1</sup>
Force	1	N	1 (5)	dyne
Pressure	1	Pa	1 (−1)	dyne cm <sup>−2</sup>
Energy	1	J	1 (7)	erg
Charge	1	C	2.9979 (9)	esu
Magnetic flux density	1	T	1 (4)	gauss

Values  $a \times 10^b$  are given as  $a (b)$ .

*List of conversion factors*

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*Energy conversion factors*

	erg	eV	K	cm <sup>-1</sup>	Hz
erg	1.00	6.242 (11)	7.243 (15)	5.034 (15)	1.509 (26)
eV	1.602 (-12)	1.00	1.1604 (4)	8064.4	2.418 (14)
K	1.3806 (-16)	8.617 (-5)	1.00	0.695	2.084 (10)
cm <sup>-1</sup>	1.9865 (-16)	1.240 (-4)	1.4389	1.00	2.9970(10)
Hz	6.626 (-27)	4.136 (-15)	4.798 (-11)	3.336 (-11)	1.00

Values  $a \times 10^b$  are given as  $a (b)$ . To convert from unit in column 1 to units above the rows, multiply by value; e.g.,  $1 \text{ eV} = 1.602 \times 10^{-12} \text{ erg}$ .

A useful compendium of constants can be found in C. W. Allen, *Astrophysical Quantities*, (London: The Athlone Press). The website <http://physics.nist.gov/cuu/>, maintained by the National Institute of Standards and Technology, provides a wealth of information on constants.