

Appendix C

Physical and Astronomical Constants and Unit Conversions

Table C.1 Physical constants.

Quantity	Symbol	Value	Units
Speed of light	c	$2.997\,924\,58 \times 10^{10}$	cm^{-1}
Gravitational constant	G	$6.672\,59(85) \times 10^{-8}$	$\text{dyn cm}^2 \text{g}^{-2}$
Planck constant	h	$6.626\,075\,5(40) \times 10^{-27}$	erg s^{-1}
Boltzmann constant	k	$1.380\,658(12) \times 10^{-16}$	erg K^{-1}
Stefan–Boltzmann constant	σ	$5.670\,51(19) \times 10^{-5}$	$\text{erg cm}^{-2} \text{K}^{-4} \text{s}^{-1}$
Thomson cross-section	σ_{T}	$0.665\,246\,16 \times 10^{-24}$	cm^2
Electron charge	e	$4.803\,206\,8(15) \times 10^{-10}$	E.S.U.
Electron mass	m_{e}	$9.109\,389\,7(54) \times 10^{-28}$	g
Proton mass	m_{p}	$1.672\,623\,1(10) \times 10^{-24}$	g
Neutron mass	m_{n}	$1.674\,928\,6 \times 10^{-24}$	g
Atomic mass unit	m_{u}	$1.660\,540\,2 \times 10^{-24}$	g
Electron volt	eV	$1.602\,173\,3 \times 10^{-12}$	erg

Table C.2 Astronomical constants.

Quantity	Symbol	Value	Units
Astronomical unit	AU	1.496×10^{13}	cm
Parsec	pc	3.086×10^{18}	cm
Solar mass	M_{\odot}	1.989×10^{33}	g
Solar radius	R_{\odot}	6.955×10^{10}	cm
Solar luminosity	L_{\odot}	3.845×10^{33}	erg s ⁻¹
Solar absolute bolometric magnitude	$M_{\text{bol},\odot}$	4.72	mag
Solar absolute <i>B</i> magnitude	$M_{B,\odot}$	5.48	mag
Solar absolute <i>V</i> magnitude	$M_{V,\odot}$	4.83	mag
Solar absolute <i>J</i> magnitude	$M_{J,\odot}$	3.71	mag
Solar absolute <i>H</i> magnitude	$M_{H,\odot}$	3.37	mag
Solar absolute <i>K</i> magnitude	$M_{K,\odot}$	3.35	mag

Table C.3 Unit conversions.

Quantity	Symbol	Conversion
Angström	Å	$1 \text{ Å} = 10^{-8} \text{ cm}$
Micron	μm	$1 \text{ μm} = 10^{-4} \text{ cm}$
Parsec	pc	$1 \text{ pc} = 3.086 \times 10^{18} \text{ cm}$
Light year	ly	$9.460\,530 \times 10^{17} \text{ cm}$
Kilo-electron volt	keV	$hc/E = 12.398\,54 \times 10^{-8} \text{ cm}$
Jansky	Jy	$10^{-23} \text{ erg cm}^{-2} \text{ s}^{-1} \text{ Hz}^{-1}$