

OoMA Fact Sheet

$G = (2/3) \times 10^{-7}$ dyne-cm²/gram²
 $c = 3 \times 10^{10}$ cm/sec
 $k = (1/7) \times 10^{-15}$ erg/K
 $h = (2/3) \times 10^{-26}$ erg-sec
 $\hbar = 10^{-27}$ erg-sec
 $N_A = 6 \times 10^{23}$ nucleons/gram
 $m_p/m_e = 1836$ $m_p c^2 = 938$ MeV
 $m_e \approx 10^{-27}$ gm $m_e c^2 = 511$ keV
 $e = 4.8 \times 10^{-10}$ esu = 1.6×10^{-19} Coulomb
 $\alpha = e^2/\hbar c = 1/137$
 $L_\odot = 4 \times 10^{33}$ erg/sec
 Fusing H to He yields 0.7% of mc^2
 He to C & C to Fe about 0.1% of mc^2 each
 Solar Constant = 1.4 kW/m² at 1 AU
 $M_\odot = 2 \times 10^{33}$ grams $R_\odot = 7 \times 10^{10}$ cm
 $R_\oplus = 6371$ km $M_\oplus = 3 \times 10^{-6} M_\odot$
 $M_J = 10^{-3} M_\odot$
 Hubble radius = $c/H_0 = 1.3 \times 10^{28}$ cm
 Critical density $\sim 10^{-29}$ g/cm³
 $\sigma_T = (2/3) \times 10^{-24}$ cm²
 $\sigma_{SB} = 5.67 \times 10^{-5}$ erg/cm²/sec/K⁴
 Flux from a blackbody surface is $\sigma_{SB} T^4$
 1 Farad = 9×10^{11} cm
 1 ohm = $1/(9 \times 10^{11})$ sec/cm
 1 gram calorie = 4.2 Watt-sec or Joules
 Dietary calories are really kilocalories.
 1 kiloton (kT) of TNT is the kinetic energy of 1000 metric tonnes moving at 2.9 km/sec. [1 kT = 10^{12} gram-cal exactly]
 Supernova kinetic energy = 10^{51} ergs
 1 AU = $(3/2) \times 10^{13}$ cm
 1 radian = 2×10^5 arc-seconds
 1 square arcsec = 2.4×10^{-11} steradians
 1 pc = 3×10^{18} cm
 1 erg = 6×10^{11} eV
 1 eV $\sim 12,000$ K 1 eV $\sim 1.2 \mu\text{m}$
 $hc/k \approx 1.44$ cm K
 1 Jy = 10^{-23} ergs/cm²/sec/Hz
 1 year $\approx \pi \times 10^7$ seconds
 1 Mpc is 1 km/sec for 1000 Gyr
 One atmosphere or 1 bar = 10^6 dyne/cm²
 Maximum mass for white dwarfs: $1.4 M_\odot$

Typical mass of neutron stars: $1.4 M_\odot$

Stellar spectra – from “early” = hot to “late” = cool:

Oh Be A Fine Girl Kiss Me Later Tonight

Luminosity class – the Roman numeral:

“I” = supergiant = low surface gravity

“III” = giant, “V” = dwarf = main sequence star = high surface gravity.

Sp.Type	$\log(L/L_\odot)$	M/ M_\odot	T_{eff} K
O5V	5.82	40	40,000
B0V	4.66	18	28,000
B5V	2.94	9	15,500
A0V	1.78	3	9900
A5V	1.15	2	8500
F0V	0.88	1.7	7400
F5V	0.54	1.3	6580
G0V	0.15	1.1	6030
G5V	-0.11	0.9	5520
K0V	-0.38	0.8	4900
K5V	-0.78	0.7	4130
M0V	-1.22	0.5	3480
M5V	-1.90	0.2	2800
L0	-3.65		2200
L5	-4.11		1700
T0	-4.57		1300
T5	-5.02		1000

1 magnitude is -4 db

A decibel (db) is a factor of $10^{0.1}$ in power.

0th mag at V $\approx 10^3$ photons/cm²/sec/Å.

$m_{bol} = 0$ for 2.5×10^{-5} erg/cm²/sec.

Bands central wavelengths in μm :

U = 0.36, B = 0.44, V = 0.55, R = 0.7,

I = 0.9, Z = 1.0, J = 1.25, H = 1.6, K =

2.2, L = 3.5, M = 4.6, N = 10, Q = 20

AB magnitudes have the same zeropoint flux in F_ν (3631 Jy) in all bands.

Johnson or “Vega” magnitudes have zero-points that follow the spectrum of an A0V star.

$10^{n/10} = 1.26, 1.6, 2, 2.5, 3.2, 4, 5, 6.3, 8.$