

OoMA Fact Sheet

$G = (2/3) \times 10^{-10}$ N-m²/kg²
 $c = 3 \times 10^8$ m/sec
 $k = (1/7) \times 10^{-22}$ J/K
 $h = (2/3) \times 10^{-33}$ J-sec
 $\hbar = 10^{-34}$ erg-sec
 $N_A = 6 \times 10^{26}$ nucleons/kg
 $m_p/m_e = 1836$ $m_p c^2 = 938$ 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
 $\alpha = e^2/\hbar c = 1/137$
 $L_\odot = 4 \times 10^{26}$ W
 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
 $R_\odot = 7 \times 10^8$ m $M_\odot = 2 \times 10^{30}$ kg
 $R_\oplus = 6371$ km $M_\oplus = 3 \times 10^{-6} M_\odot$
 $\pi R_\oplus \approx 20000$ km (by revolutionary fiat)
 $M_J = 10^{-3} M_\odot$
 Hubble radius = $c/H_0 = 1.3 \times 10^{30}$ m
 Critical density $\sim 10^{-26}$ kg/m³
 $\sigma_T = (2/3) \times 10^{-28}$ m²
 $\sigma_{SB} = 5.67 \times 10^{-8}$ J/m²/sec/K⁴
 Flux from a blackbody surface is $\sigma_{SB} T^4$
 1 gram calorie = 4.2 Watt-sec or Joules
 Dietary calories are really kilocalories.
 1 kiloton (kT) of TNT = KE of 1000 metric tonnes @ 2.9 km/sec. [1 kT = 10⁹ kg-cal exactly]
 Supernova kinetic energy = 10⁴⁴ J
 1 AU = (3/2) × 10¹¹ m
 1 radian = 2 × 10⁵ arc-seconds
 1 square arcsec = 2.4 × 10⁻¹¹ steradians
 1 pc = 2 × 10⁵ AU = 3 × 10¹⁶ m
 1 J = 10⁷ erg = 6 × 10¹⁸ eV
 1 eV ~ 12,000 K 1 eV ~ 1.2 μm
 $hc/k \approx 0.014$ m-K
 1 Jy = 10⁻²⁶ J/m²/sec/Hz
 1 year $\approx \pi \times 10^7$ seconds
 1 Mpc is 1 km/sec for 1000 Gyr
 One atmosphere or 1 bar = 10⁵ N/m²
 Maximum mass for white dwarfs: 1.4 M_⊙
 Typical mass of neutron stars: 1.4 M_⊙

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

Oh Be A Fine (Guy/Gal) 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 _⊙)	M/M _⊙	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
Y0	-6.23		500

1 magnitude is -4 db
 A decibel (db) is a factor of 10^{0.1} in power.
 0th mag at V $\approx 10^7$ photons/m²/sec/Å.
 $m_{bol} = 0$ for 2.5×10^{-8} W/m².
 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.