1 a.l.	=	$9{,}46 \times 10^{15}$ m
1 pc	=	3,26 a.l.
1 UA	=	$1{,}49 \times 10^{11}$ m
1 m_p	=	$1{,}67 \times 10^{-27}$ kg
1 $M_\odot$	=	$1{,}99 \times 10^{30}$ kg
1 $L_\odot$	=	$3{,}83 \times 10^{26}$ W
1 sir	=	$1{,}69 \times 10^{-7}$ W/m^2
c	=	3×10^8 m/s
G	=	$6{,}67 \times 10^{-11}$ N·m^2/kg^2
$K = 4\pi^2/G$	=	$5{,}92 \times 10^{11}$ s^2·kg/m^3
h	=	$6{,}63 \times 10^{-34}$ J·s
σ	=	$5{,}67 \times 10^{-8}$ W/(m^2·K^4)

$$\frac{1}{S} = \frac{1}{T_T} - \frac{1}{T_P} \qquad \frac{1}{S} = \frac{1}{T_P} - \frac{1}{T_T}$$

$$D(\text{a.l.}) = 3{,}26 \,/\, \theta(")$$

$$I = \frac{L}{4\pi D^2} \qquad I(\text{sir}) = 2{,}02 \, \frac{L(L_\odot)}{D^2\,(\text{a.l.})}$$

$$L(L_\odot) = 400\, P \text{ (jours)}$$

$$e = \frac{FF'}{PA} = \frac{FF'}{2a}$$

$$T^2(\text{an}) = a^3(\text{UA}) \qquad T^2 = K \frac{a^3}{M_c}$$

$$T^2 \text{ (années)} = \frac{a^3(\text{UA})}{M_c(M_\odot)}$$

$$\gamma = \frac{1}{\sqrt{1 - \frac{v^2}{c^2}}} \qquad E = \gamma mc^2$$

$$\gamma_{grav} = \frac{1}{\sqrt{1 - \frac{v_{lib}^2}{c^2}}} \qquad E = mc^2$$

$$D_A = (1 + e)a \qquad D_P = (1 - e)a$$

$$\frac{v_P}{v_A} = \frac{D_A}{D_P}$$

$$v_P = v_m\,(1 + e) \qquad v_A = v_m\,(1 - e)$$

$$v_m = \frac{2\pi a}{T}\,(1 - e^2)^{-1/2} \qquad F = \frac{GMm}{r^2}$$

$$g = \frac{GM}{R^2} \qquad v_{min} = \sqrt{\frac{GM}{R}}$$

$$v_{lib} = \sqrt{\frac{2GM}{R}} \qquad v_{circ} = \sqrt{\frac{GM}{r}}$$

$$T = 1/f \qquad \lambda = cT \qquad E = hf$$

$$T\,(\text{K}) = T(°\text{C}) + 273$$

$$\lambda_{pic}\,(\text{m}) = 2{,}90 \times 10^{-3} \,/\, T(\text{K})$$

$$\ell = \sigma T^4 \qquad L = \ell S$$

$$\delta = \lambda_{obs} \,/\, \lambda_{norm} \qquad \delta_D = 1 + \frac{v}{c}$$

$$\delta_{DR} = \gamma \delta_D \qquad \delta_{grav} = \gamma_{grav}$$

$$L_{max} = cT$$

$$\alpha(") = 2{,}5 \times 10^5\, \lambda \,/\, D \qquad \alpha(") = 0{,}15 \,/\, D(\text{m})$$

$$R = c^2\,(m_{av} - m_{ap})/m_{av}$$

$$T^2 = K \frac{a_{tot}^3}{M_{syst}} \qquad \frac{a_1}{a_2} = \frac{v_1}{v_2} = \frac{m_2}{m_1}$$

$$R_s = 2GM/c^2 \qquad R_s\,(\text{km}) = 3\, M(M_\odot)$$

$$\Delta a = 2Gmh \,/\, d^3$$

$$H_A = 65 \text{ (km/s)/Mpc} = 2{,}1 \times 10^{-18} \text{ s}^{-1}$$
$$= 6{,}6 \times 10^{-11} \text{ a}^{-1} = 66 \text{ (nm/a)/km}$$

$$v_A = H_A\, D_A \qquad \delta = 1/e$$

$$T_A = 2{,}73 \text{ K} \qquad T = T_A/e$$

$$H\,(\text{(km/s)/Mpc}) = 30 \sqrt{\rho_m\,(m_p/\text{m}^3)}$$

$$\rho_m = \rho_{mA} \,/\, e^3$$

$$t = \frac{2}{3H} \qquad e = (t/t_A)^{2/3}$$

$$d\,(\text{Ga.l.}) = 30\, e\,(1 - \sqrt{e}) \qquad D\,(\text{Ga.l.}) = 30\,(1 - \sqrt{e})$$

$$R_{uo}\,(\text{a.l.}) = 3\, t\,(\text{a})$$

$$t = 1{,}44\, T_{1/2} \ln((E/P) + 1))$$

$$T_{éq}\,(\text{K}) = 280\, [(1–A)\, L(L_\odot) \,/\, D^2\,(\text{UA})]^{1/4}$$

$$v_{moy} = 146 \sqrt{T(\text{K})/m(m_p)} \qquad R = v_{lib}/v_{moy} > 10$$