$1\,\mathrm{eV} = 11600\,\mathrm{K} = 1.60\times10^{-19}\,\mathrm{J} = 5.07\times10^{6}\,\mathrm{m}^{-1} = 1.52\times10^{15}\,\mathrm{s}^{-1} = 1.78\times10^{-36}\,\mathrm{kg}$

$c = 1 = 2.998\times10^{8}\,\mathrm{m/s}$
$\hbar = 1 = 197\,\mathrm{MeVfm}$
$1\,\mathrm{pc} = 3.09\times10^{16}\,\mathrm{m} = 3.26\,\mathrm{a}$
$1\,\mathrm{a} = 3.156\times10^{7}\,\mathrm{s}$
$h \equiv H_0/(100\,\mathrm{km/s/Mpc})$
$(100\,\mathrm{km/s/Mpc})^{-1} = 9.78\times10^{9}\,\mathrm{a} = 2998\,\mathrm{Mpc}$
$T_0 = 2.7255\,\mathrm{K} = 2.349\times10^{-4}\,\mathrm{eV}$
$T_{\nu0} = (4/11)^{1/3}T_0$
$z_{\mathrm{dec}} = 1090$
$m_e = 0.511\,\mathrm{MeV}$
$m_N = 938\,\mathrm{MeV}$
$m_p + m_e - m_H = 13.6\,\mathrm{eV}$

$\mathrm{M}_\odot = 1.99\times10^{30}\,\mathrm{kg}$
$\zeta(3) = 1.20206$
$m_{\mathrm{Pl}} \equiv G^{-1/2} = 1.22\times10^{22}\,\mathrm{MeV}$
$M_{\mathrm{Pl}} \equiv (8\pi G)^{-1/2} = 2.435\times10^{21}\,\mathrm{MeV}$
$g_n = g_p = g_e = 2, \qquad g_H = 4$
$Q = m_n - m_p = 1.293\,\mathrm{MeV}$
$g_*(T \ll m_e) = 3.384$
$g_{*S}(T \ll m_e) = 3.938$
$g_*(1\mathrm{MeV}) = g_{*S}(1\mathrm{MeV}) = 10.75$
$\tau_n = t_{1/2}/\ln 2 = 878\,\mathrm{s}$
$n + \nu_e \leftrightarrow p + e^-$
$\mu_e \ll T \qquad (\text{kun/when } T > 30\,\mathrm{keV})$

$$ds^2 = -dt^2 + a^2(t)\left(\frac{dr^2}{1-Kr^2} + r^2 d\theta^2 + r^2\sin^2\theta d\phi^2\right)$$

$$f(\vec{p}) = \frac{1}{e^{(E-\mu)/T} \pm 1}$$

$$n_i = \left\{ \begin{array}{c} 1 \\ 3/4 \end{array} \right\} \frac{\zeta(3)}{\pi^2} g_i T^3, \quad (T \gg m_i)$$

$$n_i = g_i\left(\frac{m_i T}{2\pi}\right)^{3/2} e^{-\frac{m_i-\mu_i}{T}}, \quad (T \ll m_i)$$

$$\left(\frac{\dot{a}}{a}\right)^2 + \frac{K}{a^2} = \frac{8\pi G}{3}\rho$$

$$\frac{\ddot{a}}{a} = -\frac{4\pi G}{3}(\rho + 3p)$$

$$\rho = \frac{\pi^2}{30} g_* T^4$$

$$s = \frac{2\pi^2}{45} g_{*S} T^3$$

$$g_*{}^{1/2} t T^2 = 0.301 m_{\mathrm{Pl}}$$

$$\rho = \frac{1}{2}\dot{\varphi}^2 + \frac{1}{2}\nabla\varphi^2 + V(\varphi)$$

$$\ddot{\varphi} - \frac{1}{a^2}\nabla^2\varphi + 3H\dot{\varphi} + V'(\varphi) = 0$$

$$n - \bar{n} = \frac{gT^3}{6\pi^2}\left[\pi^2\left(\frac{\mu}{T}\right) + \left(\frac{\mu}{T}\right)^3\right], \quad (T \gg m)$$

$$n - \bar{n} = 2g\left(\frac{mT}{2\pi}\right)^{3/2} e^{-m/T} \sinh\frac{\mu}{T}, \quad (T \ll m)$$

$$\frac{\partial\rho}{\partial t} + \nabla\cdot(\rho\vec{u}) = 0$$

$$\frac{\partial\vec{u}}{\partial t} + (\vec{u}\cdot\nabla)\vec{u} + \frac{1}{\rho}\nabla p + \nabla\tilde{\Phi} = 0$$

$$\nabla^2\tilde{\Phi} = 4\pi G\rho$$

$$\mathcal{R} = -H\frac{\delta\varphi}{\dot{\varphi}}$$

$$\mathcal{P}_g(k) \equiv \left(\frac{L}{2\pi}\right)^3 4\pi k^3 \langle|g_{\mathbf{k}}|^2\rangle$$

$$\left(\frac{2\pi}{L}\right)^3 \sum_{\mathbf{k}} \to \int d^3k$$

$$\mathcal{P}_\varphi(k) = \left(\frac{H}{2\pi}\right)^2_{|aH=a_0k}$$

$$\mathcal{P}_\mathcal{R}(k) = \left(\frac{H}{\dot{\varphi}}\right)^2 \left(\frac{H}{2\pi}\right)^2_{|aH=a_0k}$$

$$n_s(k) - 1 \equiv \frac{d\ln\mathcal{P}_\mathcal{R}}{d\ln k}$$

$$\left(\frac{\delta T}{T}\right)_{\mathrm{obs}} = \frac{1}{4}\delta_\gamma^N - \mathbf{v}^N\cdot\hat{\mathbf{n}} + \Phi(t_{\mathrm{dec}}, \mathbf{x}_{\mathrm{ls}}) + 2\int\dot{\Phi}dt$$

$$e^{i\mathbf{k}\cdot\mathbf{x}} = 4\pi\sum_{lm} i^l j_l(kx) Y_{lm}(\hat{\mathbf{x}}) Y^*_{lm}(\hat{\mathbf{k}})$$

$$\Phi_{\mathbf{k}} \equiv -\frac{3}{2}\left(\frac{aH}{a_0k}\right)^2 \delta_{\mathbf{k}}$$

$$\Phi_{\mathbf{k}} = -\frac{3+3w}{5+3w}\mathcal{R}_{\mathbf{k}}, \quad (w \equiv p/\rho)$$

$$\int d\Omega\; Y^*_{lm}(\theta,\phi) Y_{l'm'}(\theta,\phi) = \delta_{ll'}\delta_{mm'}$$

$$\sum_m |Y_{lm}(\theta,\phi)|^2 = \frac{2l+1}{4\pi}$$

$$\int_0^\infty \frac{dz}{z} j_l(z)^2 = \frac{1}{2l(l+1)}$$

$$\int_{-\infty}^{\infty} e^{-ax^2} dx = \sqrt{\frac{\pi}{a}}$$