$1\,\mathrm{pJ} = 6.24\,\mathrm{MeV} \quad 1\,\mathrm{amu} = 1.66\cdot 10^{-27}\,\mathrm{kg} = 931.5\,\mathrm{MeV}/c^2$

$1\,\mathrm{Tesla} = \frac{\mathrm{kg}}{\mathrm{C}\cdot\mathrm{s}} = 10^4\,\mathrm{Gauss}$

A Klein-Gordon egyenlet, és diszperziós relációja: $\left(\Box + \frac{m^2c^2}{\hbar^2}\right)\phi = 0 \longrightarrow E^2 = p^2c^2 + m^2c^4 \longrightarrow$

$k^2 + \frac{\omega^2}{c^2} = \frac{m^2c^2}{\hbar^2}$, ahol $\Box = \partial^\mu\partial_\mu = \partial^0\partial_0 - \nabla^2 = \frac{1}{c^2}\partial_t^2 - \triangle$

Laplace gömbi koordinátákban: $\triangle = \frac{\partial^2}{\partial r^2} + \frac{2}{r}\frac{\partial}{\partial r} - \frac{\hat{L}^2}{\hbar^2 r^2}$

Yukawa potenciál: $\Phi(r) = -g^2\frac{e^{-r/b}}{r}$

Bomlásnál: $T_{1/2} = \frac{\ln 2}{\lambda} \qquad \Gamma = \lambda\hbar \qquad$ Breit-Wigner: $\left|\Psi^2(\omega)\right| = \frac{\Gamma/2\pi}{(E-E_0)^2 + \Gamma^2/4}$

$T_{ij} = 3r_ir_j - \delta_{ij}r^2 \qquad T_{ij} = T_{ji} \qquad \mathrm{Sp}(T) = 0$

Kvadrupól momentum: $Q_{ij} = \sum_{n=1}^{A} e_nT_{ij}(r_n) = \int \varrho(r)\,T_{ij}(r)\,\mathrm{d}^3r$, ahol $\int \varrho(r)\,\mathrm{d}^3r = Z$

Ha $Q_{33} < 0$, oblate, diszkosz alakú, ha $Q_{33} > 0$, prolate, szivar alakú.

$\int\limits_{-\infty}^{+\infty} e^{-\frac{x^2}{A^2}}\mathrm{d}x = A\sqrt{\pi} \qquad \int\limits_{-\infty}^{+\infty} x^2e^{-\frac{x^2}{A^2}}\mathrm{d}x = \frac{A^3}{2}\sqrt{\pi}$

$\dot{N}_r = \sigma jN_c \qquad \Delta\sigma = \frac{\Delta\Omega}{4\pi}\sigma$

$\dot{N} = S - \lambda N$ diff. egyenlet rendszer megoldása: $N = \frac{S}{\lambda}\left(1 - e^{-\lambda t}\right)$, $T_{1/2} = \frac{\ln 2}{\lambda}$

$E_{kin} = E_{teljes} - E_{nyugalmi} = \sqrt{p^2+m^2} - m$

Tömegspektrométerben: $p = erB$

Magspin momentum: $Q_S = \langle I|\,Q\,|I\rangle = Q\sqrt{\frac{2I(2I-1)}{(2I+1)(2I+2)(2I+3)}}$

Forgó rendszer energiája: $E = \frac{j(j+1)}{2\Theta}\hbar^2$, ahol $\Theta = \int \varrho(r)\,r^2\mathrm{d}^3r$

CNO ciklus:

$$\begin{aligned}
p^+ + {}^{12}C &\rightarrow {}^{13}N + \gamma \\
{}^{13}N &\rightarrow {}^{13}C + e^+ + \nu + \gamma + 1.2\,\mathrm{MeV} \\
p^+ + {}^{13}C &\rightarrow {}^{14}N + \gamma \\
p^+ + {}^{14}N &\rightarrow {}^{15}O + \gamma \\
{}^{15}O &\rightarrow {}^{15}N + e^+ + \nu + \gamma + 1.7\,\mathrm{MeV} \\
p^+ + {}^{15}N &\rightarrow {}^{12}C + {}^{4}He
\end{aligned}$$