where L_n, L_p are Lagrange multipliers. We found it possible to arrange these two Euler-Lagrange equations in the form of a pair of coupled cubic expressions in $\rho_n^{1/3}$ and $\rho_p^{1/3}$, which we solve by starting with guesses for the densities and iterating to convergence. The details are in [20]. The fact that the scheme converges (usually in fewer than a dozen iterations) and is very robust (the original guesses can be very poor ones) is a piece of good luck due, we would like to believe, to the intercession in heaven of Thomas and Fermi.

Before I describe the results obtained by solving the above equations, let me show you a number of consequences of our model that can be deduced algebraically, without invoking computers.

6. Standard Nuclear Matter

You may readily verify that with our (clever) choice of effective interaction the energy per particle of standard ($\rho_n = \rho_p$) nuclear matter at density ρ is given by the following simple quintic equation [20]:

$$\eta(\rho) \equiv \frac{E/A}{T_0} = \frac{3}{5}(1-\gamma)\Omega^2 - \frac{1}{2}\alpha\Omega^3 + \frac{3}{5}B\Omega^5 \ , \tag{9}$$

where $\Omega = (\rho/\rho_0)^{1/3}$.

For the equilibrium density, i.e., for $\Omega = 1$, the binding per particle (in units of T_0) is

$$\eta_0 = \frac{3}{5}(1-\gamma) - \frac{1}{2}\alpha + \frac{3}{5}B \qquad (= -a_1/T_0) \ . \tag{10}$$

The equilibrium condition, $d\eta/d\Omega = 0$ at $\Omega = 1$, gives

$$0 = \frac{6}{5}(1-\gamma) - \frac{3}{2}\alpha + 3B \ . \tag{11}$$

The compressibility coefficient K, in units of T_0, is given by

$$\kappa \equiv K/T_0 = \left.\frac{d^2\eta}{d\Omega^2}\right|_{\Omega=1} = \frac{6}{5}(1-\gamma) - 3\alpha + 12B \ . \tag{12}$$