THE MYSTERY OF PLANCK-EXTENDED VERSION  
(The Power of Planck)

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1) According to the Stefan-Boltzmann’s Law: \( \frac{P \left[W\right]}{4\pi R^2} = \sigma T^4 \) [W/m²], where \( \sigma = 5.67 \cdot 10^{-8} W/m^2 K^4 \) is the Stefan-Boltzmann’s Constant. From that, we have: \( T = \left( \frac{P \left[W\right]}{4\pi R^2 \sigma} \right)^{1/4} \). If now we say \( R \) is the classic radius of the electron \( r_e = \frac{1}{4\pi \varepsilon_0} \frac{e^2}{m_e \cdot c^2} \approx 2.8179 \cdot 10^{-15} m \), and if the power \( P \) (Power of Planck) is half the Planck Constant, \( P = \frac{1}{2} \hbar \) [W], then the temperature \( T \) is exactly the CMBR of the Universe: \( T_{CMBR} = \left( \frac{\frac{1}{2} \hbar}{4\pi \varepsilon_0 \sigma} \right)^{1/4} \approx 2.7 K \)

2) I want to irradiate in the Universe all the energy of an electron by the Power of Planck we have just introduced; this is obviously happening in a time \( T_U = \frac{m_e c^2}{\hbar / 2} = 247118 \cdot 10^{20} s \). Now, I want to make a comparison between the potential energy of an electron and the energy of a photon; the ratio between them is: \( \frac{G m_e^2}{r_e \hbar \nu} \). I know from the High School that the frequency is the inverse of the period: \( \nu = \frac{1}{T} \); if now I use the \( T_U \) just introduced to get the frequency \( \nu_U \), then I get: \( \frac{r_e}{\hbar \nu_U} = \frac{1}{137} = \alpha \), that is exactly the Fine Structure Constant!

3) Still from the High School, I know that the period \( T_U \) just obtained through the Power of Planck is given by the ratio between the circumference and the revolution speed. Therefore, in our Universe: \( T_U = \frac{2\pi R_U}{c} \), so: \( R_U = \frac{c T_U}{2\pi} = 1.17908 \cdot 10^{28} m \). Moreover, the centrifugal acceleration is given by the ratio between the square speed and the radius; so, still in our Universe: \( a_U = \frac{c^2}{R_U} = 7.62 \cdot 10^{-12} m/s^2 \). Now, I wonder if there exist a “celestial body” whose gravitational acceleration is exactly \( a_U \). Well, it exists and it is the electron! In fact, if, in a classic sense, we see it as a small planet, we will have, for a small test mass \( m_x \) over its “surface”: \( m_x \cdot g_x = G \frac{m_e \cdot m_x}{r_e^2} \), from which: \( g_x = G \frac{m_e}{r_e^2} = a_U = 7.62 \cdot 10^{-12} m/s^2 \)!

4) In our Universe, according to Newton, we can get the mass from the acceleration \( a_U \): \( a_U = G \cdot M_U / R_U^2 \), so: \( M_U = a_U \cdot R_U^2 / G = 1.59486 \cdot 10^{55} kg \). If we ask ourselves how many electrons and positrons are needed to get the Universe, we would have \( N \) of them: \( N = M_U / m_e = 1.74 \cdot 10^{85} \), but now we also realize that \( R_U = \sqrt[N]{r_e} \) !
5) In our galaxy (the Milky Way) the Sun is at a distance of 8.5kpc from the centre and should have a rotation speed of 160 km/s, if it were due only to baryonic matter, that is that of the stars and of all visible matter. But we know that, on the contrary, the Sun speed is 220 km/s. So we have a discrepancy Δv of 60 km/s: (Δv=220-160=60 km/s).(1kpc=1000pc ; 1pc=1 Parsec=3,26 l.y. = 3,08·10^{16} m ; 1 light year l.y.=9,46·10^{15} m ) ( R_{Gal} = 8,5kpc = 27,71·10^{-3} l.y. = 2,62·10^{20} m is the distance of the Sun from the centre of the Milky Way)

If the Sun were at a distance R_{Gal} of 30 kpc, it would have had the same speed of 220 km/s, but the discrepancy Δv would have been higher. In general, we know from the rotation curves that:

\[ \Delta v = k \sqrt{R_{Gal}} , \]

where k =constant. We realize that: \[ k = \sqrt{2a_U} \] !!!!!! Try with the above values for the Sun and see.

6) We see here that the « Unification between Gravitation and Electromagnetism » stands:

\[ \frac{1}{4\pi e^2 r_e} = G \frac{m_e M_U}{R_U} \] !!!!!!

7) Let’s start from the RADIATION CONSTANT: \[ a = \frac{4\pi}{c} = \frac{8\pi^2 k^4}{15c^3 h^3} = 7,566·10^{-16} \frac{J}{m^3 K^4} . \] We know from physics that it respects the following law: \[ u = a T^4 ; \] \[ [u]=\left[ \frac{J}{m^3} \right] \] and \( \sigma \) is the Stefan-Boltzmann’s Constant. With a spherical Universe (for reasons of symmetry) and as the Universe cannot have a translational motion (because it would need a bigger Universe in which to translate), its motion is just rotational, with an energy: \[ E = \frac{1}{2} I_U \omega_u^2 , \]

where \( I_U \) is the moment of inertia and, for a sphere, we know that:

\[ I_U = \frac{2}{5} M_U R_U^2 \]

and \( \omega_u \), from physics, is:

\[ \omega_u = \frac{2\pi}{T_U} , \]

where \[ T_U = \frac{2\pi R_U}{c} \] . Now, we have:

\[ \omega_u = \frac{2\pi}{2\pi R_U} = \frac{c}{R_U} , \]

from which: \[ E = \frac{1}{2} \frac{2}{5} M_U R_U^2 \left( \frac{c}{R_U} \right)^2 = \frac{1}{5} M_U c^2 \] , and, for \( u[J/m^3] \):

\[ u[J/m^3] = \frac{E}{V} = \frac{1}{\frac{5}{3} \frac{M_U c^2}{\pi R_U^3}} \]

\[ = \frac{3}{20} \frac{M_U c^2}{\pi R_U^3} = a T_{CMBR} \]

from which:

\[ T_{CMBR} = \left( \frac{3}{20} \frac{M_U c^2}{a \pi R_U^3} \right)^{1/4} = \left( 9c^2 h^3 M_U / 32 \pi^2 k^4 R_U^4 \right)^{1/4} \]

\[ = \left( 72 G c^2 h^3 e_0^4 m_e^6 / \pi^2 e^2 k^4 \right)^{1/4} = 2,72846(02218319896) K \approx 2,72846 K \]

which is very sharp, as the official measured value is \( T_{CMBR} = 2,72548 K \), so we are in the 0,1%!!! (3rd decimal!)

8) Let’s consider the Heisenberg’s Indetermination Principle (taken with the equal sign, out of simplicity):

\[ \Delta p \cdot \Delta x = \hbar / 2 \]

\( (\hbar / 2 = h / 4\pi = 0,527 \cdot 10^{-34} J \cdot s) \). We realize and can be also proved that (just numerically):

\[ \Delta p \cdot \Delta x = m_c \cdot \frac{a_U}{(2\pi)^2} = 0,527 \cdot 10^{-34} \]

which is exactly \( h / 2 = h / 4\pi \) and very very sharp!!!!!!

Bibliography: \[ \text{ http://vixra.org/abs/1303.0074 } \]


Thank you.
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