# UNIFICATION GRAVITATION ELECTROMAGNETISM

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**Abstract:** Unification Gravitation Electromagnetism.

This is the Universe:

$$M_{Univ} = 1{,}59486 \cdot 10^{55}\, kg$$

$$R_{Univ} = 1{,}17908 \cdot 10^{28}\, m \ .$$

$$T_{Univ} = \frac{2\pi R_{Univ}}{c} = 2{,}47118 \cdot 10^{20}\, s$$

The mass is bigger than that visible (as claimed nowadays) and the density is that observed:

$$\rho = M_{Univ} / (\frac{4}{3}\pi \cdot R_{Univ}^3) = 2.32273 \cdot 10^{-30}\, kg/m^3$$

The composition of all small electric interactions in the Universe makes the Universe itself; in fact, incidentally:

$$\frac{1}{4\pi\varepsilon_0}\frac{e^2}{r_e} = G\frac{m_e M_{Univ}}{R_{Univ}}$$ (UNIFICATION GRAVITATION ELECTROMAGNETISM)

( $r_e = \frac{1}{4\pi\varepsilon_0}\frac{e^2}{m_e \cdot c^2} \cong 2{,}8179 \cdot 10^{-15}\, m$ is the classic radius of the electron)

Moreover, incidentally:

$m_e c^2 = G\frac{m_e M_{Univ}}{R_{Univ}}$ , $G\frac{M_{Univ}}{R_{Univ}^2} = G\frac{m_e}{r_e^2} = a_{Univ} = 7{,}62 \cdot 10^{-12}\, m/s^2$ , $h = \frac{2 m_e c^2}{T_{Univ}}$ (numerically)

$R_{Univ} = \sqrt{N} r_e$ (being $N = M_{Univ}/m_e = 1{,}74 \cdot 10^{85}$), $T_{Univ}\frac{G m_e^2}{h r_e} = \frac{1}{137} = \alpha$

$T_{CMBR} = (\frac{h}{2 m_e \sigma}\frac{M_{Univ}}{4\pi R_{Univ}^2})^{1/4} \cong 2{,}7K$ (where $\sigma = 5{,}67 \cdot 10^{-8}\, W/m^2 K^4$ is the Stefan-Boltzmann's Constant)

$$T_{CMBR} = (\frac{3c^3}{80\pi\sigma}\frac{M_{Univ}}{R_{Univ}^3})^{1/4} = (\frac{72 G c^{11} h^3 \varepsilon_0^4 m_e^6}{\pi^2 e^8 k^4})^{1/4} = 2{,}72846(02218319896)K \cong 2{,}72846K$$

-Being from Heisenberg: $\Delta p \cdot \Delta x = \hbar/2$ (with the equality sign, out of simplicity and $\hbar/2 = h/4\pi = 0{,}527 \cdot 10^{-34}\, J \cdot s$), we can say:

$$\Delta p \cdot \Delta x = m_e c \cdot \Delta x = m_e c \cdot [\frac{1}{(2\pi)^2} G\frac{M_{Univ}}{R_{Univ}^2}] = 0{,}527 \cdot 10^{-34}$$ (numerically)

-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= $3{,}26\_l.y. = 3{,}08 \cdot 10^{16}\, m$ ; 1 light year l.y.= $9{,}46 \cdot 10^{15}\, m$ )

( $R_{Gal} = 8{,}5kpc = 27{,}71 \cdot 10^3\_l.y. = 2{,}62 \cdot 10^{20}\, m$ is the distance of the Sun from the centre of the Milky Way)

If the Sun were at a distance RGAL 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: $k = \sqrt{\frac{2 G M_{Univ}}{R_{Univ}^2}}$ .

Thank you.
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