Numbers leave very little to imagination.

EMBARRASSING OBVIOUSNESS - UNIFICATION GRAVITY ELECTROMAGNETISM

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Introduction.

Prevailing science itself tells us the electric force (which fully rules the motion of an electron around a proton, in a hydrogen atom H, for instance, is enormously stronger than the gravitational one, which, on the contrary, fully rules the motion of galaxies and that of the Universe, as well, more generally. But now, we cannot avoid to see that the dimensions of atoms are, by the same token, enormously smaller than those of the Universe and, more consistently, than those of my Universe.

On the basis of all that, do you think it’s all about a coincidence? Come on….. Maybe they do, but not us.

Moreover, it seems all things around us (matter, light, photons etc) have to do with waves; on this purpose, go to page 10.

Fourier himself suggests to see all on an oscillatory basis; in the image below you can see the graphical development of Fourier of a square wave. And remember that, according to Fourier, even a piece of line can be developed in terms of waves. And also music coming from an orchestra can be considered as a composition of single and simple sounds, with suitable frequencies and amplitudes.

General Fourier series:

\[ f(x) = \frac{1}{2} a_0 + \sum_{k=1}^{\infty} \left[ a_k \cos kx + b_k \sin kx \right], \quad \text{where} \quad a_k = \frac{1}{\pi} \int_{-\pi}^{\pi} f(x) \cos kx \cdot dx \quad \text{and} \quad b_k = \frac{1}{\pi} \int_{-\pi}^{\pi} f(x) \sin kx \cdot dx \]
and for a square wave:

\[ f(x) = \frac{4}{\pi} \sum_{k=0}^{\infty} \sin[(2k + 1)x] \frac{1}{(2k + 1)} \]

(ref. to the above image)

(the more terms you keep, the more the composition of such sinusoidal terms will look like the developed square wave)

As well as it’s true all atoms make the Universe, it’s also true forces ruling the atom (Coulomb) gather, so making the force ruling the Universe (Newton).

In order to know how laws of electricity rule the atom, see the following link, on page 12:


Moreover, still with reference to the above figure, an atom can contract and expand back very fast, with a very high frequency. This is what happens when you hit an anvil by a hammer: atoms of iron contract and then expand back, so pushing away the hammer and making it bounce.

The anvil, as well, can jerk, upwards and then downwards, but slower than atoms, of course. The anvil is like the Universe, with its slow jerk, expanding and then collapsing back.

Atom (normal, compressed and expanded).

Anvil.

An electron which ideally gravitates around all the Universe.

And on pages 11 and 13 you can have a proof that atoms and the Universe easily follow Hooke’s Law for springs.

The numerical proof that the electrical attraction of Coulomb and the gravitational one of Newton (which, as chance would have it, have the same inverse square behaviour, with respect to the distance) are the same force, is given by the following equation:

\[ \frac{1}{4\pi\varepsilon_0} \frac{e^2}{r_e} = G \frac{m M_{\text{Univ}}}{R_{\text{Univ}}} \]

\[ (m e^2) \]

The proof for this formula is given on pages 17 and 22, below.

And what about the magnetic force? It’s just a surrogate of the electric one. On this purpose, see (page 31) the following link:

http://www.fisicamente.net/FISICA_2/Relativita_Ristretta_Rubino.pdf
And what about the nuclear ones? I don’t know, but the development in series of Fourier will be used for them, as well; moreover, it really seems the motion of the Universe does not depend on them, as well as pioneers of physical chemistry didn’t take into account nuclear forces to describe the behaviour of gases and of matter:


Someone says the electric force can be also repulsive, while the gravitational one can’t. WRONG! The gravitational one can be repulsive, as well! But the Universe is like a slow elephant which does not show us what we like in any moment, but it takes its time in moving. Now its collapsing back (and the attractive gravitational force is an unquestionable proof for that), but a long time ago, when it was expanding, matter showed mutual repulsion.

In fact, in the above figure on the development of Fourier, in a half cycle of the Universe (for instance, in the collapsing one) atoms can both expand and contract (in a single red half-wave you can see both small positive and negative half-waves).

Moreover, the proton (nucleus), which is more massive than the electron (outer peel), is showing us that in the small world of building atoms, you find a higher mass value as long as you move from the outer side to the inner one…We are collapsing! Definitely!

In other words, why is the proton more massive than the electron? Simply because the Universe which contains them is collapsing!

But after all, the prevailing science itself is unconsciously encouraging us in thinking all that; in fact, they tell us the Universe is accelerating (Ia-type supernovae). But if it expanded, then, by inertia, it would do it by also slowing down, not up…Their choice was that of inventing a dark energy, in order to justify such an enormous inconsistency, so also providing themselves with a huge job to search for such mysterious dark energy. On the contrary, I remove such a huge job, by looking at the Universe as it is and as it sincerely shows.

And I leave for them all non provable ghosts, as the unfound dark matter, the unfound dark energy, the passed away cosmic ether, the awkward superluminal neutrinos, faster than light etc.

Well, we have to admit that if matter shows mutual attraction as gravitation, then we are in a harmonic and oscillating Universe in contraction towards a common point, that is the center of mass of all the Universe. As a matter of fact, the acceleration towards the center of mass of the Universe and the gravitational attractive properties are two faces of the same medal. Moreover, all the matter around us shows it wants to collapse: if I have a pen in my hand and I leave it, it drops, so showing me it wants to collapse; then, the Moon wants to collapse into the Earth, the Earth wants to collapse into the Sun, the Sun into the centre of the Milky Way, the Milky Way into the centre of the cluster and so on; therefore, all the Universe is collapsing. Isn’t it?

So why do we see far matter around us getting farther and not closer? Easy. If three parachutists jump in succession from a certain altitude, all of them are falling towards the center of the Earth, where they would ideally meet, but if parachutist n. 2, that is the middle one, looks ahead, he sees n. 1 getting farther, as he jumped earlier and so he has a higher speed, and if he looks back at n. 3, he still sees him getting farther as n. 2, who is making observations, jumped before n. 3 and so he has a higher speed. Therefore, although all the three are accelerating towards a common point, they see each other getting farther. Hubble was somehow like parachutist n. 2 who is making observations here, but he didn’t realize of the collapsing acceleration.

At last, I remind you again of the fact that recent measurements on Ia type supernovae in far galaxies, used as standard candles, have shown an accelerating Universe; this fact is against the theory of our supposed current post Big Bang expansion, as, after that an explosion has ceased its effect, chips spread out in expansion, ok, but they must obviously do that without accelerating.

Sometimes, someone says that for two parachutists who are perfectly parallel each other, there wouldn’t be any getting farther. Well, that’s a limit situation in which the exception proves the rule. In the Hubble’s Law for the expansion of the Universe, you cannot even number the exceptions:


Here below is my Universe. Have a nice reading.
THE WHOLE UNIVERSE IN THREE NUMBERS

Introduction.

\[ M_{\text{Univ}} = 1.59486 \cdot 10^{55} \text{ kg} \]  \hspace{1cm} (A)
\[ R_{\text{Univ}} = 1.17908 \cdot 10^{28} \text{ m} \]  \hspace{1cm} (B)
\[ T_{\text{Univ}} = 2.47118 \cdot 10^{20} \text{ s} \]  \hspace{1cm} (C)

Here are the three numbers, maybe magic ones, which describe our Universe.
Mass, radius and period (say, the age) of the Universe.

For the moment, let’s not ask ourselves where we dug them up. We say they have been revealed and now we test them. Let’s see if there is a consistency between the Universe we see and that ruled by those three numbers.

Speed of light.

We know that the speed of light, at least in the zone of the Universe where we live, is \( c = 299.792,458 \text{ km/s} \).

Now, incidentally, we realize that:

\[ c^2 = \frac{GM_{\text{Univ}}}{R_{\text{Univ}}} \]

from which:

\[ c = \sqrt{\frac{GM_{\text{Univ}}}{R_{\text{Univ}}}} = 299.792.458 \text{ m/s} \]

Uhm, it’s just a coincidence.

The Fine Structure Constant.

We know that \( \alpha = \frac{1}{137} = \frac{1}{4\pi e_0} \frac{\hbar}{2\pi} \) is the Fine Structure Constant.

But we see that the Fine Structure Constant can be given also by the following equation:

\[ \alpha = \frac{1}{137} = \frac{r_e}{\hbar \nu_{\text{Univ}}} = \frac{r_e}{\hbar \frac{1}{T_{\text{Univ}}}} \]

where \( T_{\text{Univ}} \) is one of the three magic numbers; more exactly, (C).

\( m_e \) and \( r_e \) are mass and classic radius of the electron: \( m_e = 9.1 \cdot 10^{-31} \text{ kg} \) and \( r_e = 2.818 \cdot 10^{-15} \text{ m} \).

…another coincidence…and not coarse at all…It’s very sharp!...

Link between T and R.

The number (C) \( T_{\text{Univ}} \) is not free from the other two (A) and (B), but it’s linked, for instance, to (B), through the following:
Planck’s Constant.

I realize that:

\[ h = 2 \frac{m_c c^2}{T_{\text{Univ}}} = 6,625 \cdot 10^{-34} \text{ [W]} \] (coincidence just numerical, not dimensional)

Uhm, once again, a coincidence.

Stefan-Boltzmann’s Constant.

Stefan-Boltzmann’s Law: \( \frac{P_{\text{[W]}}}{4 \pi R^2} = \sigma T^4 \) [W/m²], where \( \sigma = 5,67 \cdot 10^{-8} W/m^2K^4 \) is the Stefan-Boltzmann’s Constant.

Moreover, we remind ourselves of the Cosmic Microwave Background Radiation CMBR temperature:

\[ T_{\text{CMBR}} \approx 2,73 K \]

Now, with great surprise, we notice that if we get \( \sigma \) from the Stefan-Boltzmann’s Law and if we use our three magic numbers (A), (B) and (C), we finally get:

\[ \sigma = \frac{P_{\text{[W]}}}{4 \pi R^2 T^4} = \frac{T_{\text{Univ}}^2}{4 \pi R_{\text{Univ}}^2 T_{\text{CMBR}}^4} = 5,67 \cdot 10^{-8} W/m^2K^4 \]

which is exactly the Stefan-Boltzmann’s Constant!

Oh, no…
That’s enough!

Still on Stefan-Boltzmann’s Constant, with the electron.

And now the electron, too, shows up and claims, as its own temperature, the Cosmic Microwave Background Radiation CMBR temperature:

\[ T_e = T_{\text{CMBR}} \approx 2,73 K \]

The Universal Gravitational Constant.

Well, that’s too easy…:

\[ G = \frac{c^2 R_{\text{Univ}}}{M_{\text{Univ}}} \approx 6,67 \cdot 10^{-11} N \cdot m^2 / kg^2 \]
Potential number of electrons (and positrons) in the Universe.

Well, we know that the mass of the electron ("base" and stable particle, in the Universe; a real harmonic) is \( m_e = 9.1 \times 10^{-31} \) kg.

In order to get the potential number of electrons and positrons, we easily say:

\[
N = \frac{M_{\text{Univ}}}{m_e} \equiv 1.75 \times 10^{85}
\]

On the other hand, as the classic radius of the electron is: \( r_e = 2.8179 \times 10^{-15} \) m, we immediately realize that:

\[
R_{\text{Univ}} = \sqrt{N}r_e = 1.17908 \times 10^{28} \text{ m}
\]

Ops, it could be another coincidence…

Cosmic acceleration.

![Fig. A: Coma galaxy cluster.](image)

Above Fig. A is a picture of the Coma cluster, about which hundreds of measurements are available; well, we know the following data about it:

distance \( \Delta x = 100 \) Mpc = 3,26 \( 10^8 \) l.y. = 3,09 \( 10^{24} \) m

speed \( \Delta v = 6870 \) km/s=6,87 \( 10^6 \) m/s.

Then, from physics, we know that:

\[
\Delta x = \frac{1}{2} a \cdot \Delta t^2 = \frac{1}{2} (a \cdot \Delta t) \cdot \Delta t = \frac{1}{2} \Delta v \cdot \Delta t
\]

from which: \( \Delta t = \frac{2 \cdot \Delta x}{\Delta v} \), which, if used in the definition of acceleration \( a_{\text{Univ}} \), yields:

\[
a_{\text{Univ}} = \frac{\Delta v}{\Delta t} = \frac{\Delta v}{2 \cdot \Delta x} = \frac{(\Delta v)^2}{2 \cdot \Delta x} = a_{\text{Univ}} \approx 7.62 \times 10^{-12} \text{ m/s}^2
\]

cosmic acceleration

after that we used data on Coma cluster, indeed.

This is the acceleration by which all our visible Universe is accelerating towards the center of mass of the whole Universe.

Now, the classic radius of an electron, previously introduced, is defined by the equality of its energy \( E = m_ec^2 \) and its electrostatic one, imagined on its surface (in a classic sense):

\[
m_e \cdot c^2 = \frac{1}{4\pi\varepsilon_0} \frac{e^2}{r_e},
\]

from which:
\[ r_e = \frac{1}{4\pi\varepsilon_0} \frac{e^2}{m_e c^2} \approx 2.8179 \cdot 10^{-13} \text{m}. \]

Now, still in a classic sense, if we imagine, for instance, to figure out the gravitational acceleration on an electron, as if it were a small planet, we must easily conclude that:

\[ m_e \cdot g_e = G \frac{m_e \cdot m_m}{r_e^2}, \text{ from which:} \]

\[ g_e = G \frac{m_m}{r_e^2} = 16\pi^2 \varepsilon_0^2 \frac{Gm_e^3 c^4}{e^4} (= a_{\text{Univ}}) = 7.62 \cdot 10^{-12} \text{m/s}^2 \]

Uhm..., I get the same acceleration for the largest cosmic object I know, a galaxy cluster, as well as for a very little electron.

I want to go deeper in all this.

What do our magic numbers (A), (B) and (C) tell us about?

That’s what they tell us, if we ask them the acceleration value by which the Universe accelerates, indeed:

\[ a_{\text{Univ}} = \frac{c^2}{R_{\text{Univ}}} = 7.62 \cdot 10^{-12} \text{m/s}^2, \text{ (as we know, from physics, that } a = \frac{v^2}{r} \text{), and:} \]

\[ a_{\text{Univ}} = G \cdot M_{\text{Univ}} / R_{\text{Univ}}^2 = 7.62 \cdot 10^{-12} \text{m/s}^2 \text{ (from the Newton’s Universal Gravitation Law)} \]

Still the same value: \[ a_{\text{Univ}} = 7.62 \cdot 10^{-12} \text{m/s}^2. \]

Well, once again a multiple coincidence…

**Still on Planck’s Constant.**

We also notice that:

\[ h = m_e c \frac{a_{\text{Univ}}}{\pi} = 6.625 \cdot 10^{-34} \text{Js} \text{ (coincidence just numerical, not dimensional)} \]

…but who knows why…

**Again on the speed of light.**

Incidentally, I also notice that:

\[ c = \sqrt{\frac{a_{\text{Univ}} \cdot R_{\text{Univ}}}{a_{\text{Univ}}}} \approx 3 \cdot 10^8 \text{m/s} \]

…but maybe we already met it…

**Mass and radius of the electron.**

I do not know why (for the moment), but I notice two strange questions:

\[ m_e = \frac{a_{\text{Univ}}}{G} r_e^2 = 9.1 \cdot 10^{-31} \text{kg} \text{ (the mass of the electron, indeed)} \]
\[ r_e = \left( \frac{1}{4\pi \varepsilon_0} \cdot \frac{R_{\text{Univ}} e^2}{a_{\text{Univ}} M_{\text{Univ}}} \right)^{\frac{1}{3}} \approx 2,8179 \cdot 10^{-15} \text{ m} \] (the classic radius of the electron, indeed)

Well, once again a coincidence…

**The observed density of the Universe.**

We notice that the density of the Universe which can be figured by our magic numbers (A) and (B) is really that observed by astrophysicists:

\[ \rho = \frac{M_{\text{Univ}}}{\left( \frac{4}{3} \pi \cdot R_{\text{Univ}}^3 \right)} = 2,32273 \cdot 10^{-30} \text{ kg / m}^3 \]

and its not the same as that theoretical from classic cosmology, hoping that they have one, as they talk about bunches of dark matter which cannot be found…

**And we could go on and on……**

**Boltzmann’s Constant:**

\[ k = \frac{1}{T_{\text{CMBR}}} \cdot \sqrt[\frac{4}{3}]{\frac{c^3}{\pi^2 R_{\text{Univ}}^3} \cdot \left( \frac{15}{16} m_e^2 M_{\text{Univ}} \right)^{\frac{1}{4}}} = 1,38 \cdot 10^{-23} \text{ J / K} \]

For all those whom want to understand what’s behind all these apparent coincidences, I suggest the reading of what follows below, on my oscillating Universe.
On my oscillating Universe.

1- The Universe and the concept of oscillation.
2- Springs and Hooke’s Law.
3- The oscillations in matter and in all the Universe.
4- The Hooke’s Law and the Universe.
5- An exposition of the Universe from more intuitive concepts.
6- On the Cosmic Microwave Background Radiation (CMBR) at 2,73 kelvin.
7- On the galaxy rotation curves (too fast) and on the cosmic acceleration.
8- Unification between Gravity and Electromagnetism.
9- The fourth dimension, unjustifiable, unascertainable and not plausible.
10- The speed limit c is unjustified in the official physics of many universities.
11- No links between microscopic and macroscopic worlds, in the physics of many universities.
12- Link between the Universe and the Heisenberg Indetermination Principle.
13- On the total disagreement, between the theory and the measurements, on the lost energies.
14- On the absence of antimatter in our Universe.
15- Universe from nothing…does talking about nothing make any sense?
16- On further points of weakness for the official physics.

Appendix: Physical Constants.

Bibliography

Abstract: In this paper I will prove that oscillations are a basis for all the Universe, for all its essence and for all its existence. The showing up of a particle-antiparticle pair corresponds to the expansion of a small spring, while the next getting closer of those two particles in the pair, and its annihilation, is a recontracting and releasing of that small spring. The showing up and the annihilation, on a small scale, correspond to the expansion and recontraction of the Universe, on a large scale. And here I also prove that, as chance would have it, either atomic systems (made of + and – particles), or the gravitational ones (such as the solar system or the Universe itself) unequivocally follow the Hooke’s Law, so they behave like springs! Therefore, the Universe is a large spring which oscillates between a Big Bang and a Big Crunch.
1- The Universe and the concept of oscillation.

We have to admit that waves have a lot to do with the Universe. A photon is a wave (also) and matter is wave, somehow, through the Schrodinger equation. Moreover, a particle and an antiparticle, by annihilation, generate photons, so waves, and, on the contrary, we can have particles starting from photons.

For a satisfactory proof of the Schrodinger Equation, go to:

http://rinabrundu.files.wordpress.com/2012/06/la-quantizzazione-delluniverso-di-leonardo-rubino.pdf

(page 68, in the English version)

An oscillating spring, for instance, can be represented by a wave.

In case of electromagnetic waves (photon), the wave can be represented by the wave equation, indeed, also known as D’Alembert equation:

\[ \frac{\partial^2 \Psi}{\partial t^2} - \frac{1}{c^2} \frac{\partial^2 \Psi}{\partial x^2} = 0 \]

In case of matter, the right equation is the Schrodinger one (here in a simple form):

\[ \frac{\partial \Psi}{\partial t} = \frac{i \hbar}{2m} \frac{\partial^2 \Psi}{\partial x^2} \]

which is not the same as the D’Alembert’s one. The difference is not only in the time derivative degree, but is also shown by the functions which satisfy it; for what the D’Alembert’s equation is concerned, the function has an argument like this: \((k \cdot x - \omega t)\) :

\[ \Psi(k \cdot x - \omega t) \]

and space and time are together in the same argument. For a photon, which follows the Equation of D’Alembert, group velocity and phase velocity are the same and are \(c\).

On the contrary, with the Schrodinger’s equation, it’s the same as the equation of the standing waves (still with reference to the above link, on page 72):

\[ \frac{\partial^2 \Psi}{\partial x^2} + k^2 \Psi = 0 \]

and space and time can also show up in different arguments, as well as for the equations of the standing waves indeed (still with reference to the above link, on page 72):

\[ \Psi(x,t) = A \sin kx \cdot \cos \omega t \]

(1.1)

and phase group velocities can be different, that is, the wave speed and the particle one, which is represented by the former (wave), can be not the same.

The D’Alembert wave equation, as a matter of fact, when meeting a function with separate coordinates, as in (1.1), yields the equation of the standing waves, and so also a Schrodinger equation:

\[ \frac{\partial^2 \Psi}{\partial t^2} = \frac{1}{c^2} \frac{\partial^2 \Psi}{\partial x^2} \]

where \(\Psi(x,t) = \varphi(x) \sin \omega t\) yields:

\[ \frac{d^2 \varphi}{dx^2} + \frac{\omega^2}{c^2} \varphi = 0 \]

2- Springs and Hooke’s Law.

Hooke’s Law:

if a force \(F\) makes an extension \(\Delta x\), we have:

\[ F = -k \cdot \Delta x \]

where \(k\) is the elastic constant of the spring (Hooke’s Law).

Then, if we have \(N\) identical springs (whose elastic constant is \(k_e\)) in series, then, such a system is the same as just one big spring whose elastic constant is \(k_{Univ}\), so that \(k_e = N \cdot k_{Univ}\); in fact:
\[ \Delta x = \Delta x_1 + \Delta x_2 + \ldots + \Delta x_N = - \frac{F}{k_e} - \frac{F}{k_e} - \ldots - \frac{F}{k_e} = -F \frac{N}{k_e} = -F \frac{1}{k_{Univ}}, \text{ or:} \]

\[ F = -k_{Univ} \cdot \Delta x, \text{ where} \]

\[ k_{Univ} = k_e / N \]  

(2.1)

3- The oscillations in matter and in all the Universe.

Hooke’s Law for a particle-antiparticle (electron-positron), or for a hydrogen atom H, or for an atom, in general:

![Fig. 3.1: H Atom (normal, compressed and expanded).](image)

All what’s shown in fig. 3.1 also happens in the atoms of the anvil, somehow, when it’s hit by a hammer:

![Fig. 3.2: Anvil.](image)
In polar coordinates, for an electron orbiting around a proton, there is a balancing between the electrostatic attraction and the centrifugal force:

\[ F_r = -\frac{1}{4\pi\varepsilon_0} \frac{e^2}{r^2} + m_e \frac{v^2}{r} = -\frac{1}{4\pi\varepsilon_0} \frac{e^2}{r^2} + m_e\omega^2 r = -\frac{1}{4\pi\varepsilon_0} \frac{e^2}{r^2} + m_e \left( \frac{d\phi}{dt} \right)^2 r = -\frac{1}{4\pi\varepsilon_0} \frac{e^2}{r^2} + \frac{p^2}{m_e r^2}, \]  

(3.1)

where \( \frac{d\phi}{dt} = \omega \) and \( p = m_e v \cdot r = m_e \omega r = m_e \omega v^2 \).

Let’s figure out the corresponding energy by integrating such a force over the space:

\[ U = -\int F_r dr = -\frac{1}{4\pi\varepsilon_0} \frac{e^2}{r} + \frac{1}{2} m_e \omega^2 r^2 = -\frac{1}{4\pi\varepsilon_0} \frac{e^2}{r} + \frac{1}{2} m_e v^2 = -\frac{1}{4\pi\varepsilon_0} \frac{e^2}{r} + \frac{p^2}{2m_e r^2} = U. \]  

(3.2)

![Graph of the electric energy.](image)

The point of minimum in \((r_0, U_0)\) is a balance and stability point \((F_r=0)\) and can be calculated by zeroing the first derivative of (3.2) (i.e. setting \(F_r=0\) indeed).

Moreover, around \(r_0\), the curve for \(U\) is visibly replaceable by a parabola \(U_{Parab}\), so, in that neighbourhood, we can write:

\[ U_{Parab} = k(r - r_0)^2 + U_0, \]  

and the relevant force is:

\[ F_r = -\partial U_{Parab} / \partial r = -2k(r - r_0) \]  

(3.3)

which is, as chance would have it, an elastic force \((F = -kx\ - \text{Hooke’s Law})\).
We now set the equality between (3.1) and (3.3):

\[-2k(r - r_0) = -\frac{1}{4\pi_0} \frac{e^2}{r^2} + m_e \frac{v^2}{r},\]

which yields, after introducing the electromagnetic Hooke elastic constant \(k_e\):

\[-k_e (r - r_0) = -\frac{1}{4\pi_0} \frac{e^2}{r^2} + m_e \frac{v^2}{r} ; \text{ now, we derive both sides on } r, \text{ so having: } -k_e = \frac{2}{4\pi_0} \frac{e^2}{r^3} - m_e \frac{v^2}{r^2}, \]

that is:

\[k_e = -\frac{2}{4\pi_0} \frac{e^2}{r^3} + m_e \frac{v^2}{r^2}. \quad (3.4)\]

Now, we will deal with an electron-positron system, rather than a proton-electron one, as we want to see the Universe as made of harmonics, as well as the music from an orchestra can be seen, according to Fourier, as made of sines and cosines. An electron is a harmonic, as it’s stable. On the contrary, a proton doesn’t seem so.

If now we take an electron-positron system, at distance \(r_e\), where \(r_e\) is the classic radius of the electron, those two particles will orbit one around the other by the speed of light, because of the very definition of the classic radius of the electron, itself:

\[r_e = \frac{1}{4\pi_0} \frac{e^2}{m_e \cdot c^2} \approx 2,8179 \cdot 10^{-15} m, \quad (3.5)\]

and (3.4) will yield:

\[k_e = -\frac{2}{4\pi_0} \frac{e^2}{r_e^3} + m_e \frac{c^2}{r_e^2}, \] which, together with the expression for \(m_e \cdot c^2\) given by the (3.5) itself, will yield:

\[k_e = -\frac{1}{4\pi_0} \frac{e^2}{r_e^3} = -1,027 \cdot 10^{16} \text{ N/m} \quad (3.6)\]

Hooke’s Law for a gravitational system (Earth-Sun), or for the Universe, in general:

\[F_r = \frac{-GM_{Univ}}{r^2} + m_e \frac{v^2}{r} = \frac{-GM_{Univ}}{r^2} + m_e \omega^2 r = \frac{-G m_e M_{Univ}}{r^2} + m_e \left(\frac{d\varphi}{dt}\right)^2 r = \frac{-G m_e M_{Univ}}{r^2} + \frac{p^2}{m_e r^3} \quad (3.7)\]
where \( \frac{d\varphi}{dt} = \omega \) and \( p = m_e v \cdot r = m_e \omega r = m_e \omega r^2 \)

Let’s figure out the corresponding energy by integrating such a force over the space:

\[
U = -\int F_r dr = -G \frac{m_e M_{\text{Univ}}}{r^2} + \frac{1}{2} m_e \omega^2 r^2 = -G \frac{m_e M_{\text{Univ}}}{r^2} + \frac{1}{2} m_e v^2 = -G \frac{m_e M_{\text{Univ}}}{r^2} + \frac{p^2}{2m_e r^2} = U
\]

(3.8)

![Graph of the gravitational energy.](image)

The point of minimum in \((r_0, U_0)\) is a balance and stability point \((F_r = 0)\) and can be calculated by zeroing the first derivative of (3.8) (i.e. setting \(F_r = 0\) indeed).

Moreover, around \(r_0\), the curve for \(U\) is visibly replaceable by a parabola \(U_{\text{Parab}}\), so, in that neighbourhood, we can write:

\[
U_{\text{Parab}} = k(r - r_0)^2 + U_0,
\]

and the relevant force is:

\[
F_r = -\frac{\partial U_{\text{Parab}}}{\partial r} = -2k(r - r_0)
\]

which is, as chance would have it, an elastic force \((F = -kx\text{ - Hooke’s Law})\).

Now, we set the equality between (3.7) and (3.9):

\[-2k(r - r_0) = -G \frac{m_e M_{\text{Univ}}}{r^2} + m_e \frac{v^2}{r},\]

which yields, after having introduced the gravitational Hooke’s elastic constant \(k_{\text{Univ}}\):
\[-k_{\text{Univ}}(r - r_0) = -G \frac{m_e M_{\text{Univ}}}{r^2} + m_e \frac{v^2}{r};\] we now derive both sides on \( r: \)
\[ -k_{\text{Univ}} = 2G \frac{m_e M_{\text{Univ}}}{r^3} - m_e \frac{v^2}{r^2},\]
that is:
\[ k_{\text{Univ}} = -2G \frac{m_e M_{\text{Univ}}}{r^3} + m_e \frac{v^2}{r^2}. \tag{3.10} \]

If now we consider a Universe-electron system, where the electron is gravitating at a distance \( R_{\text{Univ}} \) from the center of mass of the Universe itself, where \( R_{\text{Univ}} \) is the radius of the Universe, the electron will ideally have to orbit around the Universe, with the speed of light, through the very definition of the speed of light, as where we are now, at a distance \( R_{\text{Univ}} \) from the center of mass, the (collapsing) speed must be really \( c \), by the very definition of the orbital velocity:
\[ m_e \frac{c^2}{R_{\text{Univ}}} = G \frac{m_e M_{\text{Univ}}}{R_{\text{Univ}}^2}, \]
from which:
\[ c^2 = G \frac{M_{\text{Univ}}}{R_{\text{Univ}}}, \tag{3.11} \]
and (3.10) becomes:
\[ k_{\text{Univ}} = -2G \frac{m_e M_{\text{Univ}}}{R_{\text{Univ}}^3} + m_e \frac{c^2}{R_{\text{Univ}}} \tag{3.12} \]

The (3.11) into (3.12) yields:
\[ k_{\text{Univ}} = -2G \frac{m_e M_{\text{Univ}}}{R_{\text{Univ}}^3} + m_e G \frac{M_{\text{Univ}}}{R_{\text{Univ}}^3} = -G \frac{m_e M_{\text{Univ}}}{R_{\text{Univ}}^3} = k_{\text{Univ}} \tag{3.13} \]

Now, we prove in advance that if I have \( N \) small springs with extension \( r_e \) and if such little springs build a large spring, whose total extension is \( R_{\text{Univ}} \), then we have:
\[ R_{\text{Univ}} = \sqrt{N} r_e \tag{3.14} \]

**Proof**:
the radius of the Universe is equal to the classic radius of the electron multiplied by the square root of the number of electrons (and positrons) \( N \) in which the Universe can be thought as made of. (We know that in reality almost all the matter in the Universe is not made of \( e^+e^- \) pairs, but rather of \( p^+e^- \) pairs of hydrogen atoms H, but we are now interested in considering the Universe as made of basic bricks, or in fundamental harmonics, if you like, and we know that electrons and positrons are basic bricks, as they are stable, while the proton doesn’t seem so, and then it’s neither a fundamental harmonic, and so nor a basic brick).  

Suppose that every pair \( e^+e^- \) (or, for the moment, also \( p^+e^- \) (H), if you like) is a small spring and that, for the same reason, the Universe is a big oscillating spring (now contracting towards its center of mass) with an oscillation amplitude obviously equal to \( R_{\text{Univ}} \), which is made of all microoscillations of \( e^+e^- \) pairs.  And, at last, we confirm that those micro springs are all randomly spread out in the Universe, as it must be; therefore, one is oscillating to the right, another to the left, another one upwards and another downwards, and so on. Moreover \( e^+ \) and \( e^- \) components of each pair are not fixed, so we will not consider \( N/2 \) pairs oscillating with an amplitude \( 2r_e \), but \( N \) electrons/positrons oscillating with an amplitude \( r_e \).

![Fig. 3.6: The Universe represented as a set of many (N) small springs, oscillating on random directions, or as a single big oscillating spring.](image-url)
Now, as those micro oscillations are randomly oriented, their random composition can be shown as in the figure below.

We can obviously write that: \( \vec{R}_{\text{Univ}}^N = \vec{R}_{\text{Univ}}^{N-1} + \vec{r}_e \) and the scalar product \( \vec{R}_{\text{Univ}}^N \) with itself yields:

\[
\vec{R}_{\text{Univ}}^N \cdot \vec{R}_{\text{Univ}}^N = (R_{\text{Univ}}^N)^2 = (R_{\text{Univ}}^{N-1})^2 + 2 \vec{R}_{\text{Univ}}^{N-1} \cdot \vec{r}_e + r_e^2;
\]

we now take the mean value:

\[
\langle (R_{\text{Univ}}^N)^2 \rangle = \langle (R_{\text{Univ}}^{N-1})^2 \rangle + \langle 2 \vec{R}_{\text{Univ}}^{N-1} \cdot \vec{r}_e \rangle + \langle r_e^2 \rangle = \langle (R_{\text{Univ}}^{N-1})^2 \rangle + \langle r_e^2 \rangle,
\]

(3.15)

as \( 2 \vec{R}_{\text{Univ}}^{N-1} \cdot \vec{r}_e = 0 \), because \( \vec{r}_e \) can be oriented randomly over 360° (or over \( 4\pi \) sr, if you like), so a vector averaging with it, as in the previous equation, yields zero.

We so rewrite (3.15): \( \langle (R_{\text{Univ}}^N)^2 \rangle = \langle (R_{\text{Univ}}^{N-1})^2 \rangle + \langle r_e^2 \rangle \) and proceeding, on it, by induction:

(by replacing \( N \) with \( N-1 \) and so on):

\[
\langle (R_{\text{Univ}}^N)^2 \rangle = \langle (R_{\text{Univ}}^{N-2})^2 \rangle + \langle r_e^2 \rangle,
\]

then: \( \langle (R_{\text{Univ}}^N)^2 \rangle = \langle (R_{\text{Univ}}^{N-1})^2 \rangle + \langle r_e^2 \rangle \) etc, we get:

\[
\langle (R_{\text{Univ}}^N)^2 \rangle = \langle (R_{\text{Univ}}^{N-2})^2 \rangle + \langle (R_{\text{Univ}}^{N-3})^2 \rangle + 2 \langle r_e^2 \rangle = \ldots = 0 + N \langle r_e^2 \rangle = N \langle r_e^2 \rangle,
\]

that is:

\[
\langle (R_{\text{Univ}}^N)^2 \rangle = N \langle r_e^2 \rangle,
\]

from which, by taking the square roots of both sides:

\[
\sqrt{\langle (R_{\text{Univ}}^N)^2 \rangle} = R_{\text{Univ}} = \sqrt{N} \sqrt{r_e^2} = \sqrt{N} \cdot r_e,
\]

that is:

\[
R_{\text{Univ}} = \sqrt{N} \cdot r_e
\]

4- The Hooke’s Law and the Universe.

Now, let’s find the link between \( k_e \) and \( k_{\text{Univ}} \), given by (3.6) and (3.13), below reported:

\[
k_e = -\frac{1}{4\pi \varepsilon_0} \frac{e^2}{r_e^2} = -1,027 \cdot 10^{16} \frac{N}{m}
\]

\[
k_{\text{Univ}} = -G \frac{m_e M_{\text{Univ}}}{R_{\text{Univ}}^3}
\]

According to all reasonings carried out around point 2, and around (2.1), we can say that: \( k_e = N \cdot k_{\text{Univ}} \) and \( N \) is the number of electrons (and/or positrons), that are harmonics, and the Universe can be considered as made of:

\[
N = M_{\text{Univ}} / m_e.
\]

(4.1)

Therefore, we have: \( k_{\text{Univ}} = -G \frac{m_e N m_e}{N^{3/2} r_e^3} = -G \frac{m_e^2}{N^{3/2} r_e^3} = \frac{k_e}{N} \), from which: \( k_e = -G \frac{m_e^2}{r_e^3} N^{1/2} \), and so:

\[
N = (-k_e \frac{r_e^3}{G m_e^2})^2 = 1,74 \cdot 10^{85}
\]

and also: \( M_{\text{Univ}} = N m_e = 1,59486 \cdot 10^{55} \text{ kg} \) and \( R_{\text{Univ}} = \sqrt{N} r_e = 1,17908 \cdot 10^{28} \text{ m} \).

Moreover, right because of (3.6) and (3.13):

\[
-\frac{1}{4\pi \varepsilon_0} \frac{e^2}{r_e^2} = -N G \frac{m_e M_{\text{Univ}}}{R_{\text{Univ}}^3}, \quad \text{that is:} \quad -\frac{1}{4\pi \varepsilon_0} \frac{e^2}{r_e^2} = -G \frac{m_e M_{\text{Univ}}}{R_{\text{Univ}}^2} \frac{1}{N} = G \frac{m_e M_{\text{Univ}}}{R_{\text{Univ}}^2} \frac{1}{r_e^2}, \quad \text{from which:}
\]
\[
\frac{1}{4\pi\varepsilon_0} \frac{e^2}{r_e} = G \frac{m_e M_{Univ}}{R_{Univ}} 
\] and, according to (3.5):

\[
m_e c^2 = \frac{1}{4\pi\varepsilon_0} \frac{e^2}{r_e} = G \frac{m_e M_{Univ}}{R_{Univ}}, \tag{4.2}
\]

which is the Unification between Electromagnetism and Gravity, for all the reasons shown at point 8.

5- An exposition of the Universe from more intuitive concepts.

Classic cosmology figures out the radius of the Universe (visible matter) as:

\[
R_{Univ} \approx 4000\text{Mpc} \approx 13.5 \cdot 10^9 \text{light years} \tag{5.1}
\]

According to the Hubble’s Law, as a matter of fact, we have an almost constant speed to distance ratio:

\[
H = \frac{v}{d}, \text{ H is the Hubble’s Constant:} \\
H \approx 75\text{km/(s \cdot Mpc)} \approx 2.338 \cdot 10^{-18}[\frac{m}{s}] / [m] \tag{5.2}
\]

As the farthest objects ever observed are going farther with a speed which is close to that of light, we have that:

\[
H \approx c / R_{Univ}, \text{ from which: } R_{Univ} \approx c / H \approx 4000\text{Mpc} \approx 13.5 \cdot 10^9 \text{light years} \tag{5.3}
\]

which is the (5.1), indeed. See also the final part of point 16……

About the age of the Universe, with an expansion with the speed of light, we would find an amount of years equal to that in the (5.1), that is:

\[
T_{Univ} \approx 13.5 \cdot 10^9 \text{ years} \tag{5.4}
\]

For what the mass is concerned, one can easily calculate the speed of a “gravitating” mass \( m \) at the edge of the visible Universe, by the following equality between centrifugal and gravitational forces:

\[
m \cdot a = m \cdot \frac{c^2}{R_{Univ}} = G \cdot m \cdot M_{Univ} / R_{Univ}^2, \tag{5.5}
\]

from which, also considering (5.3), we have:

\[
M_{Univ} = \frac{c^3}{(G \cdot H)} \approx 1.67 \cdot 10^{53} \text{ kg} \tag{5.6}
\]

The corresponding value of density \( \rho \), for the Universe which comes out, is:

\[
\rho = M_{Univ} / (\frac{4}{3} \pi R_{Univ}^3) = (\frac{c^3}{GH}) / [\frac{4}{3} \pi (\frac{c}{H})^3] = H^2 / (\frac{4}{3} \pi G) \approx 2 \cdot 10^{-26} \text{ kg/m}^3 \text{ (too high!)} \tag{5.7}
\]

On the contrary, the astrophysicists do not measure such a value; by observing the Universe and carrying out measurements on it, they come to the following result:

\[
\rho = 2.32273 \cdot 10^{-30} \text{ kg/m}^3, \text{ which is very smaller than that in the (5.7), anyhow.}
\]

If, on the contrary, we say the Universe is 100 times bigger and heavier:

\[
R_{Univ–New} \approx 100R_{Univ} \approx 1,17908 \cdot 10^{28} \text{m} \tag{5.8}
\]

\[
M_{Univ–New} \approx 100M_{Univ} \approx 1,59486 \cdot 10^{55} \text{kg} \tag{5.9}
\]

we get:

\[
\rho = M_{Univ–New} / (\frac{4}{3} \pi \cdot R_{Univ–New}^3) = 2.32273 \cdot 10^{-30} \text{kg/m}^3 \tag{5.10}
\]

which is the right measured density!

Through those new bigger values, and by getting rid of the “New”, we also realize that:

\[
c^2 = \frac{GM_{Univ}}{R_{Univ}} \tag{5.11}
\]

\[\text{~(Eddington)}\]
About the new $T_{\text{Univ}}$ of the Universe, we know from physics that: $v=\omega R$ and $\omega = 2\pi / T$, and, for the whole Universe: $c=\omega R_{\text{Univ}}$ and $\omega = 2\pi / T_{\text{Univ}}$, from which:

$$T_{\text{Univ}} = \frac{2\pi R_{\text{Univ}}}{c} = 2.47118 \cdot 10^{20} \text{s} \quad (7.840 \text{ billion years})$$

(5.12)

which is, for sure, at least 100 times longer than that in the (5.4), and even if we extended it to a cycle time, so that it became:

$$T_{\text{Univ-cyc}} = \frac{2\pi R_{\text{Univ-cyc}}}{c} = 2.67 \cdot 10^8 \text{s} \quad (\text{that is, the time in the (5.4) extended to a complete cycle})$$

(5.13)

So, we have obtained a lower density, in agreement with what observed by astrophysicists and we have also got rid of the presumptuousness to be able to observe the farthest objects at the borders of the Universe.

Moreover, there isn’t any need anymore to consider lots of dark and invisible matter to make their wrong theoretical density match that effectively measured.

It’s difficult to have consistency for an expanding Universe which also shows global attractive/collapsing properties, in form of gravity.

Moreover, their recent measurements on far Ia supernovae, used as standard candles, proved the Universe to be accelerating indeed, and this is against the theory of the supposed post Big Bang expansion, as, after that an explosion has ceased its effect, chips spread out in expansion, ok, but they must obviously do that without accelerating.

Physics of many universities must deal with (and is already dealing with) all this!

Well, we have to admit that if matter shows mutual attraction as gravitation, then we are in a harmonic and oscillating Universe in contraction towards a common point, that is the center of mass of all the Universe. As a matter of fact, the acceleration towards the center of mass of the Universe and the gravitational attractive properties are two faces of the same medal. Moreover, all the matter around us shows it wants to collapse: if I have a pen in my hand and I leave it, it drops, so showing me it wants to collapse; then, the Moon wants to collapse into the Earth, the Earth wants to collapse into the Sun, the Sun into the centre of the Milky Way, the Milky Way into the centre of the cluster and so on; therefore, all the Universe is collapsing. Isn’t it?

So why do we see far matter around us getting farther and not closer? Easy. If three parachutists jump in succession from a certain altitude, all of them are falling towards the center of the Earth, where they would ideally meet, but if parachutist n. 2, that is the middle one, looks ahead, he sees n. 1 getting farther, as he jumped earlier and so he has a higher speed, and if he looks back at n. 3, he still sees him getting farther as n. 2, who is making observations, jumped before n. 3 and so he has a higher speed. Therefore, although all the three are accelerating towards a common point, they see each other getting farther. Hubble was somehow like parachutist n. 2 who is making observations here, but he didn’t realize of the collapsing acceleration.

At last, I remind you again of the fact that recent measurements on Ia type supernovae in far galaxies, used as standard candles, have shown an accelerating Universe; this fact is against the theory of our supposed current post Big Bang expansion, as, after that an explosion has ceased its effect, chips spread out in expansion, ok, but they must obviously do that without accelerating.

Sometimes, someone says that for two parachutists who are perfectly parallel each other, there wouldn’t be any getting farther. Well, that’s a limit situation in which the exception proves the rule. In the Hubble’s Law for the expansion of the Universe, you cannot even number the exceptions, as we already saw before.

6- On the Cosmic Microwave Background Radiation (CMBR) at 2,73 kelvin.

The Universe is permeated with an electromagnetic radiation (CMBR) with a certain frequency and so with a certain wavelength.

According to Wien’s Law, for such a wavelength ($1.06 \cdot 10^{-3} [m]$) there is a value of temperature for the body which emitted it:

$$\lambda_{\text{max}} = \frac{C}{T} = \frac{0.2897 \cdot 10^{-2}}{T} = 1.06 \cdot 10^{-3} \quad [m]$$

(Wien’s Law)

(6.1)

($C = 0.2897 \cdot 10^{-2} \quad [K \cdot m]$ it is the Wien’s Constant)

from which: $T = \frac{C}{\lambda} = \frac{0.2897 \cdot 10^{-2}}{1.06 \cdot 10^{-3}} \approx 2.73K$.

If now we use the Stefan-Boltzmann’s Law: $\varepsilon = \sigma T^4 [W/m^2]$ ($\sigma = 5.67 \cdot 10^{-8} W/(m^2 K^4)$), it can be also rewritten in the following way:
\[ \frac{L_{\text{Univ}}}{4\pi R_{\text{Univ}}^2} = \sigma T^4 \], where \( L_{\text{Univ}} = \frac{M_{\text{Univ}} c^2}{T_{\text{Univ}}} \) is the power, in watt, for the Universe shown in many universities.

By inverting this formula, one gets, as a temperature of their Universe:

\[ T = \left( \frac{L_{\text{Univ}}}{4\pi R_{\text{Univ}}^2 \sigma} \right)^{\frac{1}{4}} = \left( \frac{T_{\text{Univ}}}{4\pi R_{\text{Univ}}^2 \sigma} \right)^{\frac{1}{4}} \neq 2.73K \] (after having used values from the (5.1), (5.6) and (5.13))

which is a totally different value, with respect to 2.73K and much bigger.

So, what did they decided to do? They stated that such a radiation is not that of the Universe now, (although they are measuring it now), but it’s that emitted when the young Universe was approximately 350.000 years old and the radiation detached from the matter. At that time, on the contrary, the possible temperature was around 3000K (and, for sure, <50.000K), and not 2.73K. So, what did they counterinvented? That from that time to now, along billions years’, such a hot radiation (without being reabsorbed by the matter, in order to be detected by us now) has degraded by travelling, by Doppler’s effect, by red shift, so becoming a 2.73K now!!! Never putting limits on human imagination!

On the contrary, by using more consistent data from my Universe, that is the (5.8), (5.9) and (5.12), we have:

\[ L_{\text{Univ}} = \frac{M_{\text{Univ}} c^2}{T_{\text{Univ}}} = 5.80 \cdot 10^{31}W \], from which, according to Stefan-Boltzmann:

\[ T = \left( \frac{L_{\text{Univ}}}{4\pi R_{\text{Univ}}^2 \sigma} \right)^{\frac{1}{4}} \approx 2.73K \] ！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！!!!!!

It’s very interesting to notice that if we imagine an electron (“stable” and base particle in our Universe!) irradiating all energy it’s made of in time \( T_{\text{Univ}} \), we get a power which is exactly \( \frac{1}{2} \) of Planck’s constants, expressed in watt!

In fact:

\[ L_e = \frac{m_e c^2}{2T_{\text{Univ}}} = \frac{1}{2} h \text{}_W = 3.316 \cdot 10^{-34} W \] (6.2)

Moreover, we notice that an electron and the Universe have got the same luminosity-mass ratio:

\[ \frac{L_{\text{Univ}}}{M_{\text{Univ}}} = \frac{L_e}{m_e} = \frac{c^2}{T_{\text{Univ}}} = \frac{m_e}{T_{\text{Univ}}} = \frac{c^2}{2h \text{}_W} \]

and, according to Stefan-Boltzmann’s law, we can consider that both an “electron” and the Universe have got the same temperature, the cosmic microwave background one:

\[ \frac{L}{4\pi R^2} = \sigma T^4 \], from which: \( T = \left( \frac{L}{4\pi R^2 \sigma} \right)^{\frac{1}{4}} = \left( \frac{L_{\text{Univ}}}{4\pi R_{\text{Univ}}^2 \sigma} \right)^{\frac{1}{4}} = \left( \frac{L_e}{4\pi R_{\text{Univ}}^2 \sigma} \right)^{\frac{1}{4}} = \left( \frac{1}{2} \frac{h}{4\pi R_{\text{Univ}}^2 \sigma} \right)^{\frac{1}{4}} \approx 2.73K \] ！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！！!!!!!

And all this is no more true if we use data from the prevailing cosmology!

7- On the galaxy rotation curves (too fast) and on the cosmic acceleration.

Preamble:

Let’s remind ourselves of the classic radius of an electron (“stable” and base particle in our Universe!), which is defined by the equality of its energy \( E=m_e c^2 \) and its electrostatic one, imagined on its surface (in a classic sense):

\[ m_e \cdot c^2 = \frac{1}{4\pi \varepsilon_0} \frac{e^2}{r_e} \], so:

(7.1)
\[ r_e = \frac{1}{4\pi\varepsilon_0} \frac{e^2}{m_e c^2} \approx 2.8179 \times 10^{-13} \text{ m}. \]

Now, still in a classic sense, if we imagine, for instance, to figure out the gravitational acceleration on an electron, as if it were a small planet, we must easily conclude that:

\[ m_e \cdot g_e = G \frac{m_e \cdot m_e}{r_e^2}, \]

from which:

\[ g_e = G \frac{m_e}{r_e^2} = 16\pi^2 \varepsilon_0^2 \frac{G m_e^3 c^4}{e^4} (\varepsilon) = a_{\text{Univ}} = 7.62 \times 10^{-12} \text{ m/s}^2 \]

(7.2)

Being the electron base and “stable” particle, in our Universe, we consider it as a harmonic of the Universe itself. As a confirmation of that, we get the cosmic acceleration \( a_{\text{Univ}} \) of the collapse of the Universe directly from the new values of radius and mass of the Universe, shown on page 17; in fact:

\[ a_{\text{Univ}} = \frac{c^2}{R_{\text{Univ-New}}^2} = 7.62 \times 10^{-12} \text{ m/s}^2, \]

(7.3)

and the same value can be obtained from the data on the Coma galaxy cluster:

\[ a_{\text{Univ}} = \frac{G \cdot M_{\text{Univ-New}}}{R_{\text{Univ-New}}^2} = 7.62 \times 10^{-12} \text{ m/s}^2 \]

(from the Newton’s Universal Law of Gravitation)

After that we used data on Coma cluster, indeed.

This is the acceleration by which all our visible Universe is accelerating towards the center of mass of the whole Universe.

For sure you have realized that: \( g_e = a_{\text{Univ}} \), sharp to decimals. The electron is really a harmonic.

Now, as the rotation speed of galaxies is too high and with an anomalous link with the radius, and being that true also for clusters and for all big objects, someone decided to invent lots of invisible matter and energy, so going against any form of plausibility. There’s no direct proof for the existence of dark matter! Moreover, dark matter is one of the most strange objects ever invented by the official science, as it’s very dense, very heavy, dark, but also transparent; then, they put on it just one characteristic of the common matter: the gravity, in order to make their calculations match, but it’s different in all the other characteristics, where they don’t care. Moreover, the dark matter, even if it is very dense and subject to gravity, does not collapse to the centre of the galaxy....
Also their problems with the too high density of the Universe led them to state the existence of mysterious dark matter in the Universe. The density of the Universe, in the physics I show, is already plausible and consistent. Moreover, I say the extra speed on galaxies and clusters is due to the tidal force exerted by all the surrounding Universe on them, through $a_{\text{Univ}}$; as well as the Earth, which exerts a tidal force on the Moon, so forcing it to spin as fast as to show to the Earth itself always the same side.

And the size of $a_{\text{Univ}}$ is, as chance would have it, the same size of the gravitational acceleration at the borders of objects as big as galaxies. See also: http://vixra.org/pdf/1306.0197v1.pdf

**Andromeda galaxy (M31):**

Distance: 740 kpc; $R_{\text{Gal}}=30$ kpc;
Visible Mass $M_{\text{Gal}} = 3 \times 10^{11} M_{\text{Sun}}$;
Suspect Mass (+Dark) $M_{\text{Dark}} = 1.23 \times 10^{12} M_{\text{Sun}}$;
$M_{\text{Sun}}=2 \times 10^{30}$ kg; 1 pc$=3,086 \times 10^{16}$ m;

![Andromeda galaxy (M31)](http://vixra.org/pdf/1306.0197v1.pdf)

By balancing centrifugal and gravitational forces for a star at the edge of a galaxy:

$$m_{\text{star}} \frac{v^2}{R_{\text{Gal}}} = G \frac{m_{\text{star}} M_{\text{Gal}}}{R_{\text{Gal}}^2},$$

from which:

$$v = \sqrt{GM_{\text{Gal}} \frac{R_{\text{Gal}}}{R_{\text{Gal}}}}.$$

On the contrary, if we also consider the tidal contribution due to $a_{\text{Univ}}$, i.e. the one due to all the Universe around, we get:

$$v = \sqrt{GM_{\text{Gal}} \frac{R_{\text{Gal}}}{R_{\text{Gal}}} + a_{\text{Univ}} R_{\text{Gal}}};$$

let’s figure out, for instance, in M31, how many $R_{\text{Gal}}$ (how many $k$ times) far away from the center of the galaxy the contribution from $a_{\text{Univ}}$ can save us from supposing the existence of dark matter:

$$\sqrt{\frac{GM_{\text{Gal}}}{kR_{\text{Gal}}} + a_{\text{Univ}} R_{\text{Gal}}} = \frac{GM_{\text{Gal}}}{kR_{\text{Gal}} + a_{\text{Univ}} R_{\text{Gal}}},$$

so:

$$k = \left( \frac{G(M + \text{Dark} - M_{\text{Gal}})}{a_{\text{Univ}} R_{\text{Gal}}^2} \right) \approx 4;$$

therefore, at $4R_{\text{Gal}}$ far away, the existence of $a_{\text{Univ}}$ makes us obtain the same high speeds observed, without any dark matter. Moreover, at $4R_{\text{Gal}}$ far away, the contribution due to $a_{\text{Univ}}$ is dominant.

At last, we notice that $a_{\text{Univ}}$ has no significant effect on objects as small as the solar system; in fact:

$$G \frac{M_{\text{Sun}}}{R_{\text{Earth-Sun}}} \approx 8.92 \times 10^8 >> a_{\text{Univ}} R_{\text{Earth-Sun}} \approx 1.14.$$

All these considerations on the link between $a_{\text{Univ}}$ and the rotation speed of galaxies are widely open to further speculations and the equation through which one can take into account the tidal effects of $a_{\text{Univ}}$ in the galaxies can have a somewhat different and more difficult look, with respect to the above one, but the fact that practically all galaxies have dimensions in a somewhat narrow range (3 – 4 $R_{\text{Milky Way}}$ or not so much more) doesn’t seem to be like that just by chance, and, in any case, none of them have radii as big as tens or hundreds of $R_{\text{Milky Way}}$, but rather by just some times. In fact, the part due to the cosmic acceleration, by zeroing the centripetal acceleration in some phases of the revolution of galaxies, would fringe the galaxies themselves, and, for instance, in M31, it equals the gravitational part at a radius equal to:

$$G \frac{M_{\text{M31}}}{R_{\text{Gal-Max}}} = a_{\text{Univ}} R_{\text{Gal-Max}};$$

from which:

$$R_{\text{Gal-Max}} = \sqrt{\frac{GM_{\text{M31}}}{a_{\text{Univ}}}} \approx 2.5 R_{\text{M31}};$$

(7.4)

In fact, maximum radii ever observed in galaxies are not so different from this.

The masses of galaxies are limited to a certain maximum size, such as the mass of the big ISOHDFS 27.

This subject must be developed and improved more. See also: http://vixra.org/pdf/1306.0197v1.pdf
8- Unification between Gravity and Electromagnetism.

In the prevailing physics there is no possibility to link those two similar forces, in the physics of many universities. They tried many times through little understandable and little striking attempts, with the String Theory, in environments with tens of rolled dimensions (unjustifiable, unprovable and not plausible).

Now, if on the contrary, we use the (5.11) in the (7.1) we get:

$$\frac{1}{4\pi\varepsilon_0} \cdot \frac{e^2}{r_e} = \frac{GM_{Univ}m_e}{R_{Univ}}$$  \hspace{1cm} \text{(which is the (4.2) already proved)} \hspace{1cm} (8.1)

As an alternative, we know that the Fine Structure Constant is 1 divided by 137 and it’s given by the following equation:

$$\alpha = \frac{1}{137} = \frac{1}{4\pi\varepsilon_0} \cdot \frac{e^2}{\frac{h}{c}}$$

137 is given by the equation, which can be considered suitable, as well, as the Fine Structure Constant:

$$\alpha = \frac{1}{137} = \frac{r_e}{h
\nu_{Univ}}, \text{ where } \nu_{Univ} = \frac{1}{T_{Univ}}$$  \hspace{1cm} \text{ (}T_{Univ}\text{ is the new one, just obtained in (5.12))} \hspace{1cm} (8.2)

The (8.2) is a numerical coincidence which is, humbly speaking, much sharper and better than many Dirac’s ones. So, we could set the following equation and deduce the relevant consequences:

$$\alpha = \frac{1}{137} = \frac{1}{4\pi\varepsilon_0} \cdot \frac{e^2}{\frac{h}{c}} = \frac{Gm_e^2}{r_e} \hspace{1cm} \text{from which:} \hspace{1cm} \frac{1}{4\pi\varepsilon_0} \cdot \frac{e^2}{\frac{h}{c}} = \frac{c}{2\pi\nu_{Univ}} \cdot \frac{Gm_e^2}{r_e} = R_{Univ} \cdot \frac{Gm_e^2}{r_e}$$

Therefore, we can write:

$$\frac{1}{4\pi\varepsilon_0} \cdot \frac{e^2}{R_{Univ}} = \frac{Gm_e^2}{r_e}$$

Now, if we temporarily imagine, out of simplicity, that the mass of the Universe is made of $N$ electrons $e^-$ and positrons $e^+$, we could write:

$$M_{Univ} = N \cdot m_e$$

from which:

$$\frac{1}{4\pi\varepsilon_0} \cdot \frac{e^2}{R_{Univ}} = \frac{GM_{Univ}m_e}{\sqrt{N} \cdot \sqrt{N} r_e}$$

or:

$$\frac{1}{4\pi\varepsilon_0} \cdot \frac{e^2}{(R_{Univ}/\sqrt{N})} = \frac{GM_{Univ}m_e}{\sqrt{N} r_e}$$

If now we suppose that $R_{Univ} = \sqrt{N} r_e$  \hspace{1cm} (8.3)

or, by the same token, $r_e = R_{Univ}/\sqrt{N}$, then (8.3) becomes:

$$\frac{1}{4\pi\varepsilon_0} \cdot \frac{e^2}{r_e} = \frac{GM_{Univ}m_e}{R_{Univ}}$$  \hspace{1cm} \text{that is (8.1) again.} \hspace{1cm} (8.4)

Now, first of all, we see that the supposition $R_{Univ} = \sqrt{N} r_e$ is very right, as from the definition of $N$ above given, we have:

$$N = \frac{M_{Univ}}{m_e} \approx 1.75 \cdot 10^{85} \hspace{1cm} \text{(-Eddington), from which:} \hspace{1cm} \sqrt{N} \approx 4.13 \cdot 10^{42} \hspace{1cm} \text{(-Weyl)) and}$$

$$R_{Univ} = \sqrt{N} r_e \approx 1.18 \cdot 10^{38} m$$

that is the very $R_{Univ}$ value.

Equation (8.1) is of a paramount importance and has got a very clear meaning, as it tells us that the electrostatic energy of an electron in an electron-positron pair ($e^+ e^-$ adjacent) is exactly the gravitational energy given to this pair by the whole Universe $M_{Univ}$ at an $R_{Univ}$ distance! (and vice versa)
Therefore, an electron gravitationally cast by an enormous mass $M_{\text{Univ}}$ for a very long time $T_{\text{Univ}}$ and through a long travel $R_{\text{Univ}}$, gains a gravitationally originated kinetic energy so that, if later it has to release it all together, in a short time, through a collision, for instance, and so through an oscillation of the $e^+ e^-$ pair - spring, it must transfer a so huge gravitational energy indeed, stored in billion of years that if this energy were to be due just to the gravitational potential energy of the so small mass of the electron itself, it should fall short by many orders of size. Therefore, the effect due to the immediate release of a big stored energy, by $e^-$, which is known to be $\frac{GM_{\text{Univ}}m_e}{R_{\text{Univ}}}$, makes the electron “appear”, in the very moment, and in a narrow range ($r_e$), to be able to release energies coming from forces stronger than the gravitational one. I also remark here, that the energy represented by (8.1), as chance would have it, is really $m_e c^2$!, that is a sort of run taking kinetic energy, had by the free falling electron-positron pair, and that Einstein assigned to the rest matter, unfortunately without telling us that such a matter is never at rest with respect to the center of mass of the Universe, as we all are inexorably free falling, even though we see one another at rest; from which is its essence of gravitationally originated kinetic energy $m_e c^2$:

$$m_e c^2 = \frac{1}{4\pi \varepsilon_0} \frac{e^2}{r_e} = \frac{GM_{\text{Univ}}m_e}{R_{\text{Univ}}}.$$  

The directly proof the equation (8.4) $R_{\text{Univ}} = \sqrt{N} r_e$ has been already given on page 16.

9- The fourth dimension, unjustifiable, unascertainable and not plausible.

In the Theory of Relativity which is taught in many universities, the Universe is 4-dimensional and the fourth dimension would be the time. It works approximately like that. Despite that, none of us can feel the fourth length, when observing or touching, with a hand, an object in this Universe. Forget the tens of rolled on themselves dimensions from the String Theory, in which you can find analytical monstrosities, useful just for some data matching, so definitely leaving the plausibility and the simplicity invoked by the Ockham’s Rasor. When at the school they taught us the Pythagorean Theorem, they told us that in a right-angled triangle the sum of the squared catheti is equal to the squared hypotenuse:

$$(r)^2 = (x)^2 + (y)^2.$$  

![Fig. 9.1.](image)

Then, by studying the geometry in three dimensions, a new version of the Pythagorean Theorem comes out:

$$(r)^2 = (x)^2 + (y)^2 + (z)^2.$$  

![Fig. 9.2.](image)
If now we want to go on towards a mysterious 4-dimensional situation, then we would expect a version like the following one:

\[(r)^2 = (x)^2 + (y)^2 + (z)^2 + (x_i)^2\]

On the contrary, in the Special Relativity, the squared “length” of the 4-vector position is like this:

\[(\Delta x)^2 = (\Delta x_1)^2 + (\Delta x_2)^2 + (\Delta x_3)^2 - (\Delta x_4)^2, \quad \text{that is:}\]

\[(r)^2 = (x)^2 + (y)^2 + (z)^2 - (x_i)^2\]

But then, for the 4-dimensional component, do we have to use the + sign, as per the Pythagorean Theorem, or the – sign, as required by Einstein in (9.1)?

Or better, as I think, the time has nothing to do with any mysterious fourth dimension and the Universe goes on being three dimensional?

All in all, the Universe looks three dimensional to all of us and if anybody asked us to show him the fourth dimension, at least about me, we would find difficult to show it.

That – sign in the (9.1) just tells us that time has nothing to do with a fourth dimension. On the contrary, all the 4-components which appear in the 4-quantities of the Theory of Relativity, more wisely refer to the physical quantities on the falling of all the matter in the Universe, with speed c, toward the center of mass of the Universe itself.

In fact, the fourth component of the 4-vector position is really ct, the fourth component of the 4-vector momentum is mc and the fourth component of the energy is really mc². 

Rather, that – sign is typical for the vectorial compositions, such as those in the description of the Michelson & Morley experiment, where you can see vectorial compositions like the following:

\[c^2 - v^2\] which, when multiplied by the time squared, yields: \[-c^2 t^2 - v^2 t^2 = x^2 - x_i^2\], that is exactly an expression for the vectorial composition of two movements, one at speed v and another at speed c, and they want us to believe it’s about a squared hypotenuse of a right-angled four dimensional hypertriangle.

Time is just the name which has been assigned to a mathematical ratio relation between two different spaces; when I say that in order to go from home to my job place it takes half an hour, I just say that the space from home to my job place corresponds to the space of half a clock circumference run by the hand of minutes. In my own opinion, no mysterious or spatially four-dimensional stuff, as proposed by the STR (Special Theory of Relativity). On the contrary, on a mathematical basis, time can be considered as the fourth dimension, as well as temperature can be the fifth and so on.

10- The speed limit c is unjustified in the official physics of many universities.

In many universities, the speed of light (c=299,792,458 km/s) is an upper speed limit and is constant to all inertial observers, by “principle” (unexplainable and unexplained). Such a concept, as a matter of fact, is presented as a “principle” by them.

The speed of light (c=299,792,458 km/s) is an upper speed limit, but neither by an unexplainable mystery, nor by a principle, as asserted in the STR and also by Einstein himself, but rather because (and still in my opinion) a body cannot move randomly in the Universe where it’s free falling with speed c, as it’s linked to all the Universe around, as if the Universe were a spider’s web that when the trapped fly tries to move, the web affects that movement and as much as those movements are wide (v~c), that is, just to stick to the web example, if the trapped fly just wants to move a wing, it can do that almost freely (v<<c), while, on the contrary, if it really wants to fly widely from one side to the other on the web (v~c), the spider’s web resistance becomes high (mass which tends to infinity).

Having the speed of light and not having a rest mass are equivalent concepts. In fact, the photon rest mass is zero and it’s got the speed of light, indeed. Moreover, it has the same speed (c) for all inertial observers. This peculiarity, too, is shown nowadays as an unexplainable and unexplained principle, but it can have clear explanations: first of all, the observer can carry out speed measurements by using the fastest thing he knows, the light, and this gives a first explanation of the constancy of c.

Moreover, the photon cannot be either accelerated or decelerated (constancy of c) because accelerating an object means fully interact with it, by catching it and throwing it again faster.

I’m here denying the possibility to really catch a photon; I give an example: if I catch an insect by a net and then I leave the net, I cannot still say I stopped the fast flight of that insect, as it could go on flying fast also into the net, so showing us that it cannot be fully caught. If now we go back to the photon, it cannot either be absolutely caught by the matter, or accelerated; it is kept into the matter as heat, or orbiting around an electron or in whatever form you like, as well as forward and reflected waves (which are typically propagating) are trapped in a standing wave which is created by themselves when, for instance, you hit the free surface of the water in a basin!

Now, we carry out a reasoning which shows us the link between the Theory of Relativity and the collapse, indeed, of the Universe, with speed c.

A system made of a particle and an antiparticle, as well as a Hydrogen atom, and as well as a gravitational system, as the whole Universe is, behaves as springs which follow the Hooke’s Law. We already proved that in the previous pages.
Now we prove that the Theory of Relativity is just an interpretation of the oscillating Universe just described, contracting with speed c:

if in our reference system I, where we (the observers) are at rest, there is a body whose mass is m and it’s at rest, we can say:

\[ v_1 = 0 \text{ and } E_1 = \frac{1}{2} mv_1^2 = 0. \]

If now I give kinetic energy to it, it will jump to speed \( v_2 \), so that, obviously:

\[ E_2 = \frac{1}{2} mv_2^2 \]

and its delta energy of GAINED energy \( \Delta E \) (delta up) is:

\[ \Delta E = E_2 - E_1 = \frac{1}{2} mv_2^2 - \frac{1}{2} mv_1^2 = \frac{1}{2} m(v_2^2 - v_1^2) = \frac{1}{2} m(\Delta v)^2, \]

with \( \Delta v = v_2 - v_1 \).

Now, we’ve obtained a \( \Delta v \) which is simply \( v_2 - v_1 \), but this is a PARTICULAR situation and it’s true only when it starts from rest, that is, when \( v_1 = 0 \).

On the contrary: \( \Delta E = E_2 - E_1 = \frac{1}{2} mv_2^2 - \frac{1}{2} mv_1^2 = \frac{1}{2} m(v_2^2 - v_1^2) = \frac{1}{2} m(\Delta v)^2 \), where \( \Delta v \) is a vectorial delta:

\[ \Delta v = \sqrt{(v_2^2 - v_1^2)}, \]

therefore, we can say that, apart from the particular case when we start from rest (\( v_1 = 0 \)), if we are still moving, we won’t have a simple delta, but a vectorial one; this is simple base physics.

Now, in our reference system I, where we (the observers) are at rest, if we want to make a body, whose mass is \( m_0 \) and originally at rest, get speed \( V \), we have to give it a delta \( v \) indeed, but for all what has been said so far, as we are already moving in the Universe, (and with speed \( c \)), such a delta \( v \) must withstand the following (vectorial) equality:

\[ V = \Delta v = \sqrt{(c^2 - v_{\text{New Abs Univ Speed}}^2)}, \tag{10.1} \]

where \( v_{\text{New Abs Univ Speed}} \) is the new absolute speed the body \( (m_0) \) looks to have, not with respect to us, but with respect to the Universe and its center of mass.

As a matter of fact, a body is inexorably linked to the Universe where it is, in which, as chance would have it, it already moves with speed \( c \) and therefore has got an intrinsic energy \( m_0c^2 \).

In more details, as we want to give the body \( (m_0) \) a kinetic energy \( E_k \), in order to make it gain speed \( V \) (with respect to us), and considering that, for instance, in a spring which has a mass on one of its ends, for the harmonic motion law, the speed follows a harmonic law like:

\[ v = (\omega X_{\text{Max}}) \sin \alpha = V_{\text{Max}} \sin \alpha \quad (v_{\text{New Abs Univ Speed}} = c \sin \alpha, \text{ in our case}), \]

and for the harmonic energy we have, for instance, a harmonic law like:

\[ E = E_{\text{Max}} \sin \alpha \quad (m_0c^2 = (m_0c^2 + E_k) \sin \alpha, \text{ in our case}), \]

we get \( \sin \alpha \) from the two previous equations and equal them, so getting:

\[ v_{\text{New Abs Univ Speed}} = c \frac{m_0c^2}{m_0c^2 + E_k}, \]

now we put this expression for \( v_{\text{New Abs Univ Speed}} \) in (10.1) and get:

\[ V = \Delta v = \sqrt{(c^2 - v_{\text{New Abs Univ Speed}}^2)} = \sqrt{[c^2 - (c \frac{m_0c^2}{m_0c^2 + E_k})^2]} = V, \]

and we report it below:

\[ V = \sqrt{[c^2 - (c \frac{m_0c^2}{m_0c^2 + E_k})^2]} \tag{10.2} \]
If now we get $E_k$ from (10.2), we have:

$$E_k = m_0c^2 \left(\frac{1}{\sqrt{1-V^2/c^2}}-1\right) = \frac{1}{\sqrt{1-V^2/c^2}} m_0c^2 - 1,$$

which is exactly the Einstein’s relativistic kinetic energy!

If now we add to $E_k$ such an intrinsic kinetic energy of $m_0$ (which also stands “at rest” – rest with respect to us, not with respect to the center of mass of the Universe), we get the total energy:

$$E = E_k + m_0c^2 = m_0c^2 + m_0c^2 \left(\frac{1}{\sqrt{1-V^2/c^2}}-1\right) = \frac{1}{\sqrt{1-V^2/c^2}} m_0c^2 = \gamma m_0c^2,$$

which is the well known (of the Special Theory of Relativity).

All this after that we supposed to bring kinetic energy to a body at rest (with respect to us).

In case of lost energies (further phase of the harmonic motion), the following one must be used:

$$E = \frac{1}{\gamma} m_0c^2 \quad (\text{Rubino})$$

(10.3)

which is intuitive just for the simple reason that, with the increase of the speed, the coefficient $1/\gamma$ lowers $m_0$ in favour of the radiation, that is of the lost of energy; unfortunately, this is not provided for by the Theory of Relativity, like in (10.3). See also: [http://vixra.org/pdf/1403.0490v1.pdf](http://vixra.org/pdf/1403.0490v1.pdf).

11- No links between microscopic and macroscopic worlds, in the physics of many universities.

As far as I know, in the physics of many universities there is no sign useful to state a similarity between the particles and the cosmological worlds. On the contrary, the General Theory of Relativity of Einstein and the quantum world do not look to be very compatible, to them.

By the (7.2) at page 20, already, we saw the gravity acceleration on an electron is equal to the cosmic acceleration $a_{\text{Univ}}$. Moreover, by the (6.3) at page 19 we saw that the electron and the Universe can be assigned the same temperature of 2,73K. By the (6.2), then we established the link between the electron and the Planck’s Constant, through the Universe.

And, at last, by the (8.2), through the Fine Structure Constant, which is originally defined in an atomic/electronic context, we justified a much older Universe, and all this with an accuracy to the decimals.

See also the (12.1), on the next point, where the infinitesimal world Planck’s Constant is linked to the macroscopic world of the cosmic acceleration, going through the Heisenberg’s Principle of Indetermination.

12- Link between the Universe and the Heisenberg Indetermination Principle.

As far as I know, in the physics of many universities there is no sign of a direct link between the world of cosmological objects and the microscopic quantized one.

The Universe is cyclical. Even though you do not want to accept that, Fourier would make us accept it anyway, as through his developments one can even approach a stretch of a line by sine and cosine, and so through cycles, so providing a cyclical interpretation also where this shows unlikely.

The Universe has a lifetime (a period) very long, but not infinite; for statistical reasons related to the Indetermination Principle, I tell you that when it was expanding, it couldn’t do that to the infinite, as it had to grant its disappearing (its collapse) as well as it did, through the same statistical principles, to appear (see also point 15 on pages 28-29).

Now, as its period is not infinite, its frequency is not zero and all the frequencies in the Universe must be a multiple of the period, which is the smallest of all. This is the origin of the quantization!

The Heisenberg Uncertainty Principle is a consequence of the essence of the macroscopic and $a_{\text{Univ}}$ accelerating Universe, collapsing with speed $c$; according to this principle, the product $\Delta x \Delta p$ must keep above $\hbar/2$, and with the equal sign, when $\Delta x$ is at a maximum, $\Delta p$ must be at a minimum, and vice versa:

$$\Delta p \cdot \Delta x \geq \hbar/2 \quad \text{and} \quad \Delta p_{\text{max}} \cdot \Delta x_{\text{min}} = \hbar/2 \quad (\hbar = h/2\pi).$$

Now, as $\Delta p_{\text{max}}$ we take, for the electron (“stable” and base particle in our Universe!), $\Delta p_{\text{max}} = (m_e \cdot c)$, as it’s falling towards the center of mass of the Universe with linear moment $mc$, and as $\Delta x_{\text{min}}$ for the electron, as it is a
harmonic of the Universe in which it is (just like a sound can be considered as made of its harmonics), we have: 
\[ \Delta x_{\text{min}} = \frac{a_{\text{Univ}}}{(2\pi)^2}, \]

as a direct consequence of the characteristics of the Universe in which it is; in fact, 
\[ R_{\text{Univ}} = \frac{a_{\text{Univ}}}{\alpha_{\text{Univ}}}, \]
as we know from physics that \( a = \alpha R \), and then \( a_{\text{Univ}} = 2\pi/T_{\text{Univ}} = 2\pi v_{\text{Univ}} \), and as \( \alpha_e \) of the electron (which is a harmonic of the Universe) we therefore take the “\( v_{\text{Univ}} \)th” part of \( \alpha_{\text{Univ}} \), that is: 
\[ \left| \alpha_e \right| = \left| \frac{\alpha_{\text{Univ}}}{v_{\text{Univ}}} \right| \]
like if the electron of the electron-positron pairs can make oscillations similar to those of the Universe, but through a speed-amplitude ratio which is not that of the Universe indeed, but through it divided by \( v_{\text{Univ}} \), and so, if for the whole Universe: 
\[ R_{\text{Univ}} = \frac{a_{\text{Univ}}}{\alpha_{\text{Univ}}}, \]
thcn, for the electron:
\[ \Delta x_{\text{min}} = \frac{a_{\text{Univ}}}{(\alpha_e)^2} = \frac{a_{\text{Univ}}}{(\alpha_{\text{Univ}}/v_{\text{Univ}})^2} = \frac{a_{\text{Univ}}}{(2\pi)^2}, \]
from which:
\[ \Delta p_{\text{max}} \cdot \Delta x_{\text{min}} = m_e c \cdot \frac{a_{\text{Univ}}}{(2\pi)^2} = 0,527 \cdot 10^{-34} \text{ [Js]} \quad (\text{equality just numerical}) \]  
and such a number (0,527 \cdot 10^{-34} Js), as chance would have it, is really \( \hbar / 2 \) !!

13- On the total disagreement, between the theory and the measurements, on the lost energies.

In Atomic Physics, when we talk about electrons falling to inner orbits, and so losing energy, the relativity around the well known equation \( E = \gamma \cdot m_e c^2 \) is not working properly and there comes the need to bring correction factors ad hoc and one find himself surrounded by giant corrective equations, in order to make calculations match with observations (Fock-Dirac etc).

On the contrary, we already saw in (10.3) that, in case of energies released by the matter, the following holds:
\[ E = \frac{1}{\gamma} \cdot m_e c^2 \] (Rubino), not existing in the Einstein’s STR.

By using (10.3) in Atomic Physics, in order to figure out the ionization energies \( \Delta Z E_Z \) of atoms with just one electron, but with a generic \( Z \), we come to the following equation, for instance, which matches very well the experimental data:
\[ \Delta Z E_Z = m_e c^2 \left[ 1 - \sqrt{1 - \left( \frac{Ze^2}{2e_0 hc} \right)^2} \right] \quad (\text{Wåhlin}) \]  
and for atoms with a generic quantum number \( n \) and generic orbits:
\[ \Delta Z E_{Z-n} = m_e c^2 \left[ 1 - \sqrt{1 - \left( \frac{Ze^2}{4ne_0 hc} \right)^2} \right] \] (Wåhlin)

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<td>8</td>
<td>3,4041 \cdot 10^{-29}</td>
</tr>
</tbody>
</table>

Tab. 13.1: Energy levels in the hydrogen atom H (\( Z=1 \)), as per (13.2).

On the contrary, the use of the here unsuitable \( E = \gamma \cdot m_e c^2 \) doesn’t match the experimental data, but brings to complex corrections and correction equations (Fock-Dirac etc), which tries to “correct”, indeed, an unsuitable use.


14- On the absence of antimatter in our Universe.

Many are the extravagant proposals, all accepted by the prevailing physics, on parallel universes made of antimatter, made ad hoc to give oneself an explanation for the fact that in our Universe the matter has prevailed over the antimatter. So doing, they provide for a naive answer to the question about where the antimatter has got to. The Universe shows as made of hydrogen, almost completely, but also of some helium.
So, we are talking about electrons, protons and neutrons. If then we consider that the neutron contains, for sure, a proton and an electron, we can roughly talk about just ELECTRONS and PROTONS. Their antiparticles are the positron and the antiproton. (When I say that a neutron contains, at least, a proton and an electron, it’s like if I said that an egg contains a chick; now, you could argue that an egg, on the contrary, contains the albumen and the yolk (quarks), and not a chick, but as I’m certain that from that egg a chick will come out, then I go on thinking that egg=chick or, at least, egg>>chick)

If now we consider the PROTON, whose mass is 1836 times that of the ELECTRON, and if we make it reach the mass of the ELECTRON indeed, then the balance between + and – in the Universe is perfect, as it seems that the Universe contains the same number of PROTONS and ELECTRONS.

We have so given an explanation on why in the Universe the matter has prevailed over the antimatter: in fact, this is not true, as “matter” (+) and “antimatter” (-) were created (or the contrary, if you like) in a perfect balance and then, for some reason, (for sure related to the Anthropic Cosmological Principle) the balance of their masses gave up. That’s it. (And the question on the parity, that is now and then violated, nowadays, is not a problem, in my opinion)

Than, of course, nowadays we can locally produce very little antiparticles, as well as by just sine and cosine waves we can produce all possible sounds (Fourier), but this is another kettle of fish.

15- Universe from nothing…does talking about nothing make any sense?

Often, and especially in the last days, there is who talks about a Universe which appears from “nothing”; but does talking about nothing make any sense? Moreover, is it possible to imagine a perfect nothing? We will see that it’s exactly in those questions that one can find the legitimation for the Universe and for the physical consistency of its existence.

As widely shown in my works on the web, when we talk about “nothing” with reference to the Universe and its possible origins, we must always take into account that we have to deal with the the Heisenberg Indetermination Principle, from quantum mechanics. I cannot say an electron is exactly there, in that point of sharp coordinates, as measurements of positions, by which I state all that, are measurements, indeed (an evaluation). 100% certainty is impossible, as it would neglect the existence of the indetermination.

By the same token, to say a body has exactly the absolute zero temperature (-273,15°C) is unacceptable, as one would so say its atoms and its molecules have got kinetic thermal energy equal to zero, so saying that one has been able to measure a zero by a 100% accuracy, which is impossible for any instrument.

Moreover, we cannot even say before the Universe there was “nothing” (from which the Universe would be come out), as the act of stating the absolute nothing would be the same as saying an absolute zero has been measured (100%), that is something unacceptable and against quantum mechanics (somehow). Before, we were surprised by the appearing and the existence of the Universe; after the reasonings just carried out, we would start to be surprised by the existence of “nothing”, or by the concept of non existence itself, rather than that of the Universe.

Furthermore, the concept of “before” the Universe is meaningless, as if there was already something before, then we were not talking about the Universe at all; and time is part of the Universe and comes out with it, so a “before” was meaningless.

And so the concept of absolute immobility and of the (reaching of) thermal absolute zero are meaningless:

-if I want to check and so measure the immobility of a body, I have to interact with it, somehow, by illuminating it etc and so I touch it somehow (also if just by a photon) so changing the immobility I wanted to check.

- if I want to read a thermometer to check if the inside of a refrigerator has reached the absolute zero, no sooner I illuminate the thermometer (also if just by a photon) to read it indeed, I heat it and it transmits some heat to the object supposed to be at the absolute zero kelvin, so spoiling that alleged absolute zero state.

And it’s also true that we cannot even stop touching what is surrounding us; for instance:

- if I don’t see the Moon, does the Moon exist?

My answer is yes, also adding that I cannot stop seeing the Moon, as also if I turn back, I still interact with the Moon, gravitationally etc (also this is a seeing).

In the description of the very early Universe, prevailing physics stops at the dot of minimal dimensions, a subplanckian ones, beyond which every supposition is meaningless, as all suppositions can be confuted by the opposite suppositions. So doing, the schopenhauerian jump from the physics step to the metaphysics one is not taken, as I take it here, on the contrary. Let’s not forget, indeed, that the metaphysical need of the scientist and of the human being, in general, is unsuppressable, so that the physicist himself, through relativity, as well as through quantum mechanics, delegates the observer to the description of the behaviour of things, like if things had not only their own independent essence (with no links with the spark which lights us up and makes us observe), but also had another one, double linked to the first one. The physicist is who knows all without being known!
If now we go back to the appearing of the Universe, through the appearing of particles and antiparticles (+ and -), a particle-antiparticle pair, which corresponds to an energy $\Delta E$, is legitimated to appear anyhow, unless it lasts less than $\Delta t$, in such a way that $\Delta E \cdot \Delta t \leq \hbar/2$ (extrapolated from the Heisenberg Indetermination Principle); in other words, it can appear provided that the observer doesn’t have enough time, in comparison to his means of measure, to figure it out, so coming to the ascertainment of a violation of the Principle of Conservation of Energy, according to which nothing can be ether created or destroyed.

In fact, the Universe seems to vanish towards a singularity, after its collapsing, or taking place from nothing, during its inverse Big Bang-like process, and so doing, it would be a violation of such a conservation principle, if not supported by the above Indetermination Principle.

The appearing of a pair (+ and -) corresponds to the expansion of a small spring, while the approaching, one another, of the particles (+ and -), which is the annihilation, corresponds to the contraction and releasing of the small spring. The appearing and the annihilation, on a small scale, correspond to the expansion and contraction of the Universe, on a large scale.

And according to my previous works, published on the web, I proved that the atomic systems, made of particles + and -, and also the gravitational ones (such as the Universe) respect the Hooke’s Law, as chance would have it, so they behave as springs!

Therefore, in my opinion, the Universe is a big oscillating spring, between a Big Bang and a Big Crunch. Someone wonders if the next Big Bang creates again an identical Universe (and so if we will be as well as we are now), but also if that were true, nobody could verify that, as with the Big Crunch every memory and every possibility of memory and of verification would be destroyed; so, we can only talk about one Universe, this one, here and now.

Then, if now we were in an expanding Universe, we wouldn’t have any gravitational force, or it were opposite to how it is now, and it’s not true that just the electric force can be repulsive, but the gravitational force, too, can be so (in an expanding Universe); now it’s not so, but it was!

The most immediate philosophical consideration which could be made, in such a scenario, is that, how to say, anything can be born (can appear), provided that it dies, and quick enough; so the violation is avoided, or better, it’s not proved/provable, and the Principle of Conservation of Energy is so preserved, and the contradiction due to the appearing of energy from nothing is gone around, or better, it is contradicting itself.

16- On further points of weakness for the official physics.

on neutrinos faster than light:

Right after that the news on superfast neutrinos from CERN and OPERA was given, I didn’t immediately agree with it:


There are also further comments and articles of mine, on this subject, in the web.

In the last weeks, it really seems that the news on neutrinos faster than light has been denied completely:


http://news.sciencemag.org/scienceinsider/2012/02/breaking-news-error-undoes-faster.html

on the dark matter:

Dark matter, especially in the last days, is not having a so lovely time: "Serious Blow to Dark Matter Theories?", at the following link:


All in all, I personally didn’t see different epilogues:


If you are interested in the scenario where dark matter is not only not plausible, but also useless, you could read again what is above explained, on my Oscillating Universe. I do not want to carry out comparisons on entropy values across a Big Crunch, as with a Big Crunch every memory is destroyed and also space and time in it, as well as the physics on entropy itself, are destroyed.
At last, I add something: if dark matter is mistake A, the change of Newton's laws will be mistake B! And, after the dark matter, they will try to do this, too, instead of leaving their chairs to someone else. And, in order to understand what’s going on with dark matter in the last weeks, here is what…..

http://www.astronomia.com/2012/05/07/povera-materia-oscura-si-sta-rischiarando/

http://www.astronomia.com/2012/04/26/anche-le-galassie-satelliti-“contro”-la-materia-oscura/

on the particle of God:

The particle of God they looked for by powerful means, should give mass to particles. Since the beginning, it’s not so clear as it could plausibly give mass to other particles, but even if all what has been said on it is true, then we would have got rid of a little mystery (the origins of the mass of particles), but we’d also have faced a new and bigger mystery, that is the understanding why such a giving of mass occurs and exists. Let’s say that, according to the Occam’s razor, Higgs’ boson will make the Universe more difficult to be understood, in my opinion, rather than easier. And so, for such a Divine Boson, a Nobel Prize for the Physics or for the Chemistry?

In fact, such a question arises as by increasing energies and by using more powerful accelerators, they will find further new particles, as well as chemists, almost every day, invent new organic compounds, that are millions, nowadays. But all this is not the same as to say that such new “creations” give mass to others (!!!) and that have something to do with the early Universe. On the contrary, all this is like to say that in the Universe the hydrogen comes from uranium. At least, it’s exactly the opposite. On the other hand, some ultra long lagrangians have very little to do with the plausibility and the simplicity of the early Universe.

Poor Occam! But history talks plainly. The contemporary one, especially, does.

After:

-the death of the ether, in 1905, caused by an outsider, that is a third level technician of the Patent Office of Berne

-the death of the embarrassing superluminal neutrinos

http://rinabrundu.files.wordpress.com/2013/02/anno-1785-la-relativita-sinsinua.pdf

-the death of the dark matter
http://www.astronomia.com/2012/05/07/povera-materia-oscura-si-sta-rischiarando/

-the death of the dark energy (which should justify the accelerated expansion of their Universe)
http://rinabrundu.files.wordpress.com/2013/03/ovvieta-imbarazzanti-luniverso-in-contrazione.pdf

-the death of the science reliability
http://altrogiornale.org/download/267245/
http://altrogiornale.org/download/266973/

the silence, already fallen down, will ratify:

-THE DEATH OF THE DIVINE BOSON

on the cosmic ether:

A lot of years before A. Einstein published his Theory of Relativity, all the Universities, all over the world, were looking for the cosmic ether, as they thought the electromagnetic waves, and so also the light, should necessarily propagate in a mean, as well as for the sounds in the air. So, they supposed the space was filled with an extremely light and transparent gas, called ether, indeed.

And those Universities even gave very sharp values for the density of such an ether!
The Michelson and Morley experiment, made to prove the movement of the Earth through the ether, failed. The question was solved in 1905 by an employee of the Patent Office in Berne, Albert Einstein, who suggested to cease trying to prove the movement of the earth through the ether, as ether doesn’t simply exist! I add that dark matter we talk about nowadays, so strange, heavy, transparent and not plausible, will soon end up like ether!

on the dimensions of the Universe they call “observable”:

It’s about 46 billion light years and they say it’s so big as fastest objects ever seen, within the Hubble’s sphere of 13.5 billion light years, in the meantime have gone farther…; much farther. But objects must be kept where they appear, not where they think they should be, also because their gravitational and electromagnetic influences on us propagate and reach us by the speed of light and in a time of 13.5 billion years (age of their Universe), those influences must come from a 13.5 billion light years distance. Relativity, as well as quantum mechanics, teach us that we have to trust in what the observer ascertains, not to what the observer guesses; otherwise, in the Twin Paradox, the twin brother on the Earth could rightly guess that the cardiac rhythm of the travelling brother is equal to his, so denying the existence of the time dilation. In fact, both twin brothers measure, on themselves, the same cardiac rhythm, but when one measures that of the other, due to the relativistic Doppler effect, gets different values.

Thank you for your attention.
Leonardo RUBINO
leonrubino@yahoo.it
### Appendix: Physical Constants.

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boltzmann’s Constant $k$</td>
<td>$1.38 \cdot 10^{-23} \text{ J} / \text{K}$</td>
</tr>
<tr>
<td>Cosmic Acceleration $a_{\text{uni}}$</td>
<td>$7.62 \cdot 10^{-12} \text{ m} / \text{s}^2$</td>
</tr>
<tr>
<td>Distance Earth-Sun AU</td>
<td>$1.496 \cdot 10^{11} \text{ m}$</td>
</tr>
<tr>
<td>Mass of the Earth $M_{\text{Earth}}$</td>
<td>$5.96 \cdot 10^{24} \text{ kg}$</td>
</tr>
<tr>
<td>Radius of the Earth $R_{\text{Earth}}$</td>
<td>$6.371 \cdot 10^6 \text{ m}$</td>
</tr>
<tr>
<td>Charge of the electron $e$</td>
<td>$-1.6 \cdot 10^{-19} \text{ C}$</td>
</tr>
<tr>
<td>Number of electrons equivalent of the Universe $N$</td>
<td>$1.75 \cdot 10^{85}$</td>
</tr>
<tr>
<td>Classic radius of the electron $r_e$</td>
<td>$2.818 \cdot 10^{-15} \text{ m}$</td>
</tr>
<tr>
<td>Mass of the electron $m_e$</td>
<td>$9.1 \cdot 10^{-31} \text{ kg}$</td>
</tr>
<tr>
<td>Finestructure Constant $\alpha (\equiv 1/137)$</td>
<td>$7.30 \cdot 10^{-3}$</td>
</tr>
<tr>
<td>Frequency of the Universe $\nu_0$</td>
<td>$4.05 \cdot 10^{-21} \text{ Hz}$</td>
</tr>
<tr>
<td>Pulsation of the Universe $\omega_0$</td>
<td>$2.54 \cdot 10^{-20} \text{ rad/s}$</td>
</tr>
<tr>
<td>Universal Gravitational Constant $G$</td>
<td>$6.67 \cdot 10^{-11} \text{ Nm}^2 / \text{kg}^2$</td>
</tr>
<tr>
<td>Period of the Universe $T_{\text{uni}}$</td>
<td>$2.47 \cdot 10^{20} \text{ s}$</td>
</tr>
<tr>
<td>Light Year l.y.</td>
<td>$9.46 \cdot 10^5 \text{ m}$</td>
</tr>
<tr>
<td>Parsec pc</td>
<td>$3.26 _ \text{ a.l.} = 3.08 \cdot 10^{16} \text{ m}$</td>
</tr>
<tr>
<td>Density of the Universe $\rho_{\text{uni}}$</td>
<td>$2.32 \cdot 10^{-30} \text{ kg} / \text{m}^3$</td>
</tr>
<tr>
<td>Microwave Cosmic Radiation Background Temp. $T$</td>
<td>$2.73 \text{ K}$</td>
</tr>
<tr>
<td>Magnetic Permeability of vacuum $\mu_0$</td>
<td>$1.26 \cdot 10^{-6} \text{ H/m}$</td>
</tr>
<tr>
<td>Electric Permittivity of vacuum $\varepsilon_0$</td>
<td>$8.85 \cdot 10^{-12} \text{ F/m}$</td>
</tr>
<tr>
<td>Planck’s Constant $h$</td>
<td>$6.625 \cdot 10^{-34} \text{ J} \cdot \text{s}$</td>
</tr>
<tr>
<td>Mass of the proton $m_p$</td>
<td>$1.67 \cdot 10^{-27} \text{ kg}$</td>
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<tr>
<td>Mass of the Sun $M_{\text{Sun}}$</td>
<td>$1.989 \cdot 10^{30} \text{ kg}$</td>
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<tr>
<td>Radius of the Sun $R_{\text{Sun}}$</td>
<td>$6.96 \cdot 10^8 \text{ m}$</td>
</tr>
<tr>
<td>Speed of light in vacuum $c$</td>
<td>$2.99792458 \cdot 10^8 \text{ m/s}$</td>
</tr>
<tr>
<td>Stefan-Boltzmann’s Constant $\sigma$</td>
<td>$5.67 \cdot 10^{-8} \text{ W m}^2 \cdot \text{K}^4$</td>
</tr>
<tr>
<td>Radius of the Universe (from the centre to us) $R_{\text{uni}}$</td>
<td>$1.18 \cdot 10^{28} \text{ m}$</td>
</tr>
<tr>
<td>Mass of the Universe (within $R_{\text{uni}}$) $M_{\text{uni}}$</td>
<td>$1.59 \cdot 10^{55} \text{ kg}$</td>
</tr>
</tbody>
</table>
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