Everyone can have one's own opinion, but numbers are numbers and there's no question of them!
The closest thing to intelligence is simplicity.

HOOKE'S LAW AS A BASIS FOR THE UNIVERSE (of Rubino)

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For www.vixra.org

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://vixra.org/pdf/1112.0087v1.pdf (page 19)

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:

$$\frac{\partial^2\Psi}{\partial^2 t}=v^2\frac{\partial^2\Psi}{\partial x^2}$$

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: $(\vec{k}\cdot\vec{x}-wt)$:

$$\Psi(\vec{k}\cdot\vec{x}-wt)$$

and space and timee 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 23):

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

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 23):

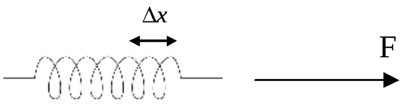
$$\Psi=2A\sin kx\cdot\cos wt \tag{1.1}$$

and phase and 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:

$$\frac{\partial^2\Psi}{\partial^2 t}=v^2\frac{\partial^2\Psi}{\partial x^2}\quad \text{, where }\ \Psi(x,t)=j(x)\sin wt\ \text{ yields: }\ \frac{d^2 j}{dx^2}+\frac{w^2}{v^2}j=0\,.$$

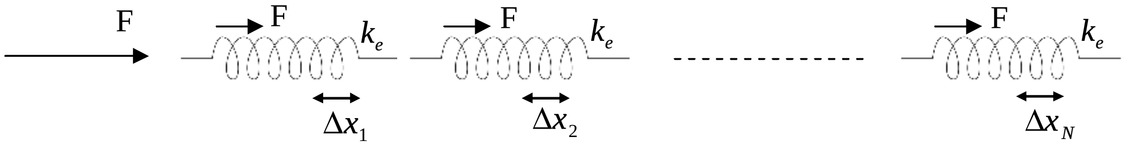
2- Springs and Hooke's Law.

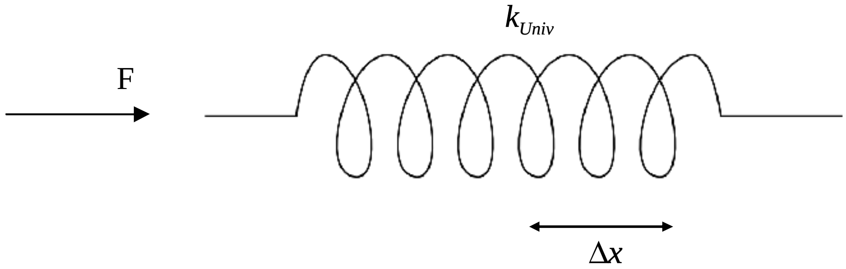
<u>Hooke's Law:</u>
if a force F makes an extension Δx, we have:



$F=-k\cdot\Delta x$, 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:





$$\Delta x = \Delta x_1 + \Delta x_2 + \ldots + \Delta x_N = -\frac{F}{k_e} - \frac{F}{k_e} - \ldots - \frac{F}{k_e} = -F\frac{N}{k_e} = -F\frac{1}{k_{Univ}}$$, or:

$F = -k_{Univ} \cdot \Delta x$, where

$$k_{Univ} = k_e / N \qquad (2.1)$$

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

<u>Hooke's Law for a particle-antiparticle (electron-positron), or for a hydrogen atom H, or for an atom, in general:</u>

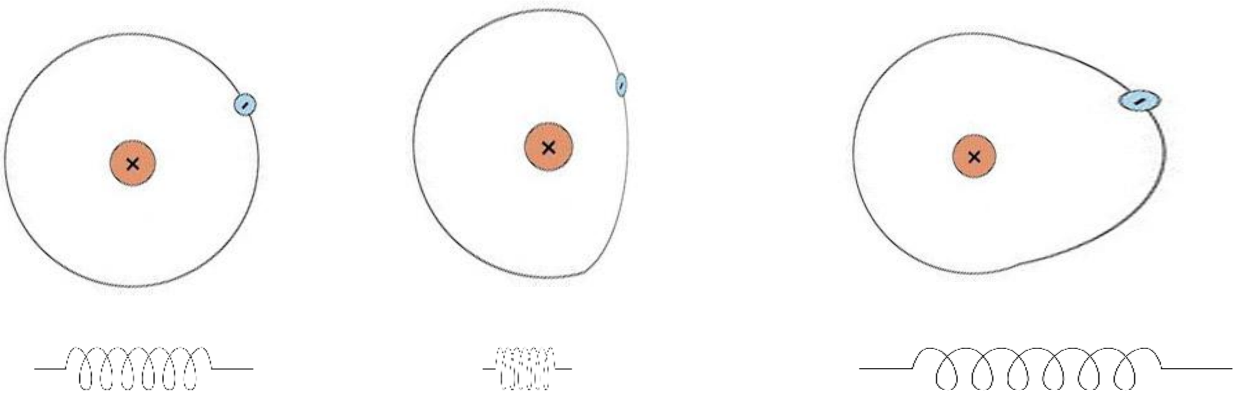


Fig. 3.1: H Atom (normal, compressed and expanded).

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

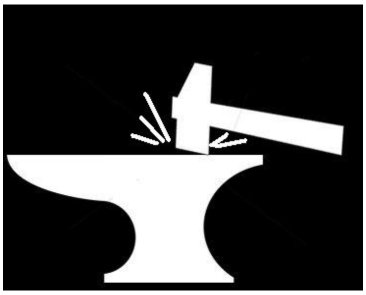


Fig. 3.2: Anvil.

In polar coordinates, for an electron orbiting around a proton, there is a balancing between the electrostatic attraction and the centrifugal force:

$$F_r = -\frac{1}{4pe_0}\frac{e^2}{r^2} + m_e\frac{v^2}{r} = -\frac{1}{4pe_0}\frac{e^2}{r^2} + m_e w^2 r = -\frac{1}{4pe_0}\frac{e^2}{r^2} + m_e(\frac{dj}{dt})^2 r = -\frac{1}{4pe_0}\frac{e^2}{r^2} + \frac{p^2}{m_e r^3}, \tag{3.1}$$

where $\frac{dj}{dt} = w$ e $p = m_e v \cdot r = m_e wrr = m_e wr^2$

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

$$U = -\int F_r dr = -\frac{1}{4pe_0}\frac{e^2}{r} + \frac{1}{2}m_e w^2 r^2 = -\frac{1}{4pe_0}\frac{e^2}{r} + \frac{1}{2}m_e v^2 = -\frac{1}{4pe_0}\frac{e^2}{r} + \frac{p^2}{2m_e r^2} = U\,. \tag{3.2}$$

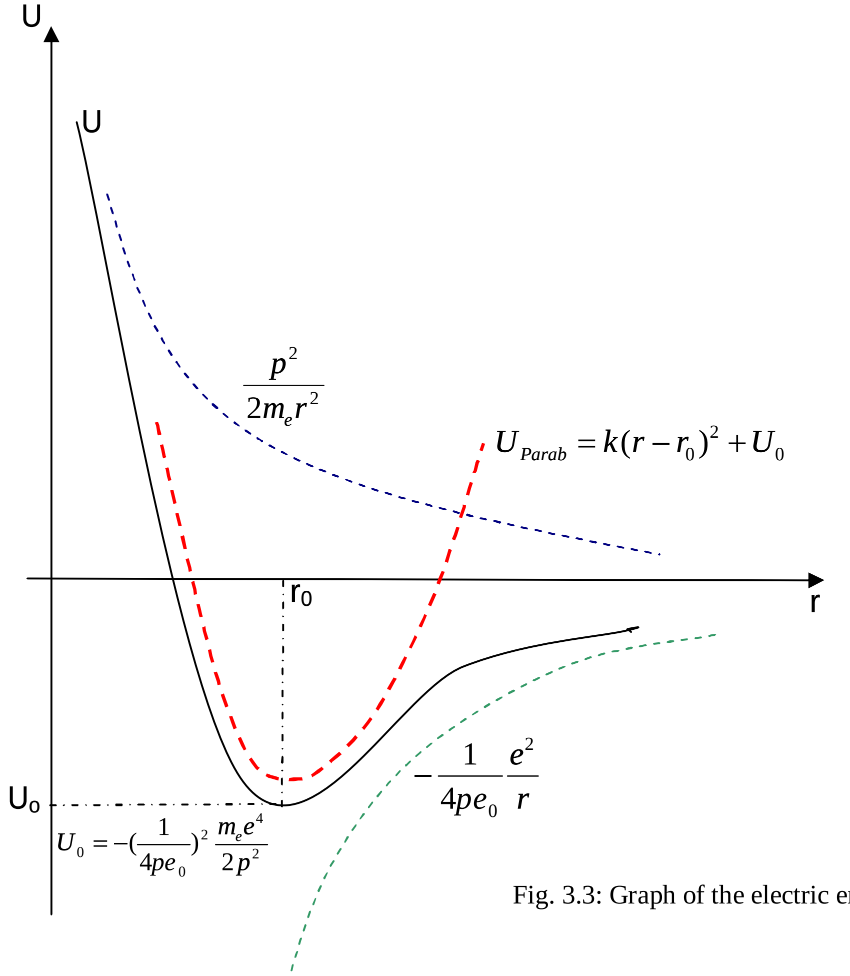


Fig. 3.3: Graph of the electric energy.

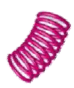
The point of minimum in (r_0,U_0) is a balance and stability point (F_r=0) and can be calculated by zeroing the first derivative of (3.2) (i.e. setting F_r=0 indeed).

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:

$$F_r = -\partial U_{Parab}/\partial r = -2k(r-r_0) \tag{3.3}$$

which is, as chance would have it, an elastic force ($F = -kx$ - Hooke's Law).



We now set the equality between (3.1) and (3.3):

$-2k(r-r_0) \;= -\frac{1}{4pe_0}\frac{e^2}{r^2}+m_e\frac{v^2}{r}$, which yields, after introducing the electromagnetic Hooke elastic constant k_e :

$-k_e(r-r_0) \;= -\frac{1}{4pe_0}\frac{e^2}{r^2}+m_e\frac{v^2}{r}$; now, we derive both sides on r, so having: $-k_e=\frac{2}{4pe_0}\frac{e^2}{r^3}-m_e\frac{v^2}{r^2}$, that is:

$$k_e=-\frac{2}{4pe_0}\frac{e^2}{r^3}+m_e\frac{v^2}{r^2} \;. \tag{3.4}$$

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-proton 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:

$$r_e=\frac{1}{4pe_0}\frac{e^2}{m_e\cdot c^2}\cong 2{,}8179\cdot 10^{-15}\,m\,, \tag{3.5}$$

and (3.4) will yield:

$k_e=-\frac{2}{4pe_0}\frac{e^2}{r_e^3}+m_e\frac{c^2}{r_e^2}$, which, together with the expression for $m_e\cdot c^2$ given by the (3.5) itself, will yield:

$$k_e=-\frac{1}{4pe_0}\frac{e^2}{r_e^3}=-1{,}027\cdot 10^{16}\,N/m \tag{3.6}$$

<u>Hooke's Law for a gravitational system (Earth-Sun), or for the Universe, in general:</u>

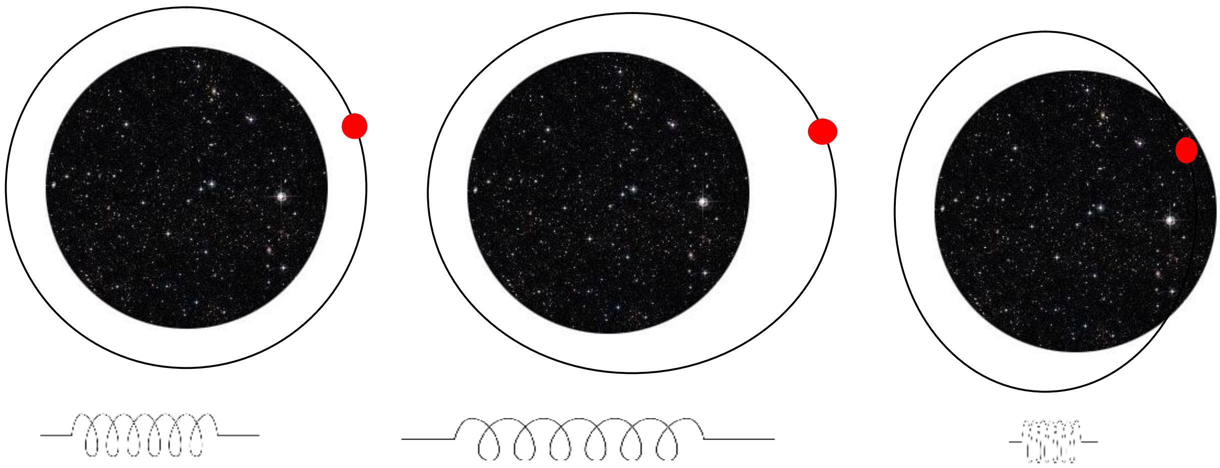


Fig. 3.4: An electron which ideally gravitates around all the Universe (normal, expanded and compressed).

In polar coordinates, for (for instance) an electron in gravitational orbit around all the Universe, there is a balance between gravitational force and centrifugal one:

$$F_r=-G\frac{m_eM_{Univ}}{r^2}+m_e\frac{v^2}{r}=-G\frac{m_eM_{Univ}}{r^2}+m_ew^2r=-G\frac{m_eM_{Univ}}{r^2}+m_e(\frac{dj}{dt})^2r=-G\frac{m_eM_{Univ}}{r^2}+\frac{p^2}{m_er^3} \tag{3.7}$$

where $\frac{dj}{dt} = w$ and $p = m_e v \cdot r = m_e wrr = m_e wr^2$

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

$$U = -\int F_r dr = -G\frac{m_e M_{Univ}}{r} + \frac{1}{2}m_e w^2 r^2 = -G\frac{m_e M_{Univ}}{r} + \frac{1}{2}m_e v^2 = -G\frac{m_e M_{Univ}}{r} + \frac{p^2}{2m_e r^2} = U \qquad (3.8)$$

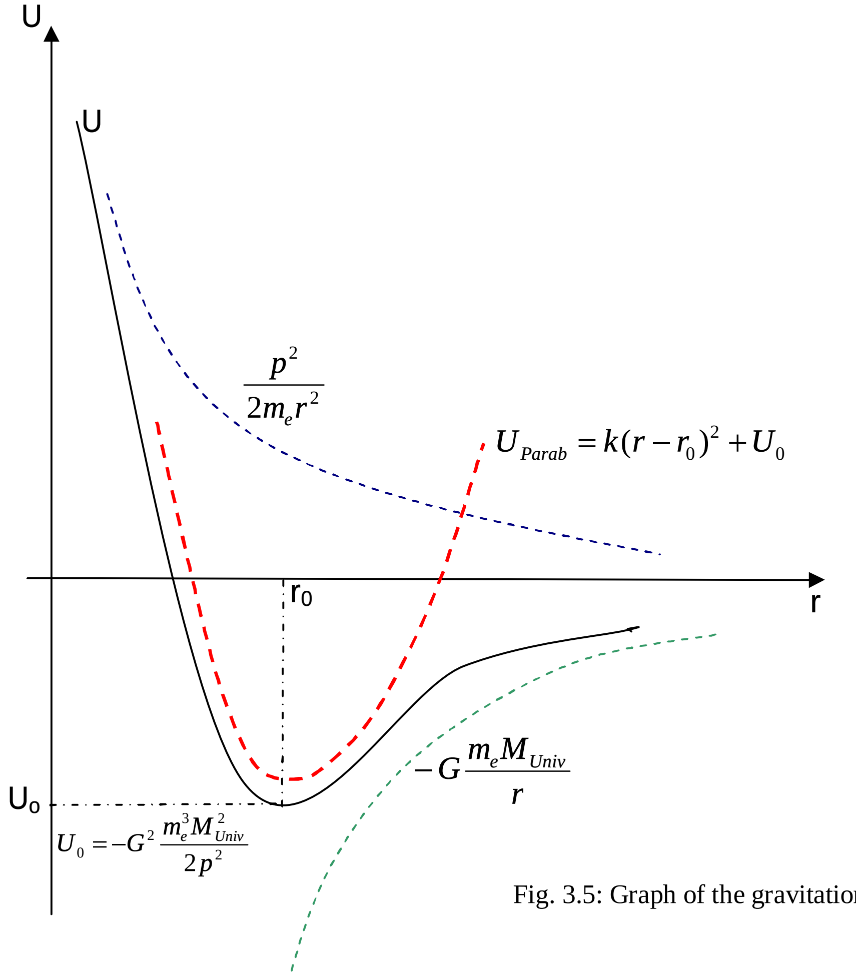


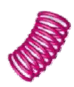
Fig. 3.5: Graph of the gravitational energy.

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_{Parab}, so, in that neighbourhood, we can write:

$U_{Parab} = k(r-r_0)^2 + U_0$, and the relevant force is:

$$F_r = -\partial U_{Parab}/\partial r = -2k(r-r_0) \qquad (3.9)$$

which is, as chance would have it, an elastic force ($F = -kx$ - Hooke's Law).



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

$-2k(r-r_0) = -G\frac{m_e M_{Univ}}{r^2} + m_e\frac{v^2}{r}$, which yields, after having introduced the gravitational Hooke's elastic constant k_{Univ}:

$-k_{Univ}(r-r_0) \; = -G\frac{m_e M_{Univ}}{r^2}+m_e\frac{v^2}{r}$; we now derive both sides on r: $-k_{Univ}=2G\frac{m_e M_{Univ}}{r^3}-m_e\frac{v^2}{r^2}$, that is:

$$k_{Univ}=-2G\frac{m_e M_{Univ}}{r^3}+m_e\frac{v^2}{r^2}\;. \tag{3.10}$$

If now we consider a Universe-electron system, where the electron is gravitating at a distance R_{Univ} from the center of mass of the Universe itself, where R_{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_{Univ} from the center of mass, the (collapsing) speed must be really c, by the very definition of the orbital velocity:

$m_e\frac{c^2}{R_{Univ}}=G\frac{m_e M_{Univ}}{R_{Univ}^2}$, from which:

$$c^2=G\frac{M_{Univ}}{R_{Univ}} \tag{3.11}$$

and (3.10) becomes: $k_{Univ}=-2G\frac{m_e M_{Univ}}{R_{Univ}^3}+m_e\frac{c^2}{R_{Univ}^2}$ (3.12)

The (3.11) into (3.12) yields:

$$k_{Univ}=-2G\frac{m_e M_{Univ}}{R_{Univ}^3}+m_e G\frac{M_{Univ}}{R_{Univ}^3}=-G\frac{m_e M_{Univ}}{R_{Univ}^3}=k_{Univ} \tag{3.13}$$

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_{Univ}, then we have:

$$R_{Univ}=\sqrt{N}r_e \tag{3.14}$$

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_{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.

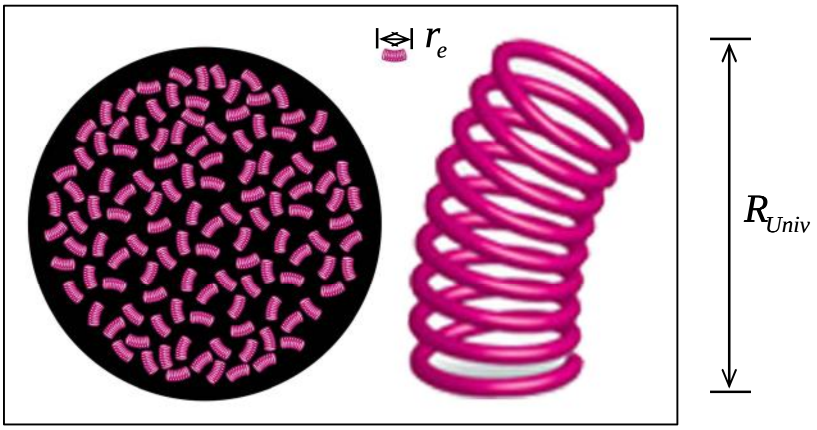


Fig. 3.6: The Universe represented as a set of many (N) small springs, oscillating on random directions, or as a single big oscillating spring.

Now, as those micro oscillations are randomly oriented, their random composition can be shown as in the figure below. We can obviously write that: $\vec{R}_{Univ}^{N} = \vec{R}_{Univ}^{N-1} + \vec{r}_e$ and the scalar product $\vec{R}_{Univ}^{N}$ with itself yields: $\vec{R}_{Univ}^{N} \cdot \vec{R}_{Univ}^{N} = (R_{Univ}^{N})^2 = (R_{Univ}^{N-1})^2 + 2\vec{R}_{Univ}^{N-1} \cdot \vec{r}_e + r_e^2$; we now take the mean value:

$$\left\langle (R_{Univ}^{N})^2 \right\rangle = \left\langle (R_{Univ}^{N-1})^2 \right\rangle + \left\langle 2\vec{R}_{Univ}^{N-1} \cdot \vec{r}_e \right\rangle + \left\langle r_e^2 \right\rangle = \left\langle (R_{Univ}^{N-1})^2 \right\rangle + \left\langle r_e^2 \right\rangle, \tag{3.15}$$

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

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

$\left\langle (R_{Univ}^{N-1})^2 \right\rangle = \left\langle (R_{Univ}^{N-2})^2 \right\rangle + \left\langle r_e^2 \right\rangle$, and then: $\left\langle (R_{Univ}^{N-2})^2 \right\rangle = \left\langle (R_{Univ}^{N-3})^2 \right\rangle + \left\langle r_e^2 \right\rangle$ etc, we get:

$\left\langle (R_{Univ}^{N})^2 \right\rangle = \left\langle (R_{Univ}^{N-1})^2 \right\rangle + \left\langle r_e^2 \right\rangle = \left\langle (R_{Univ}^{N-2})^2 \right\rangle + 2\left\langle r_e^2 \right\rangle = ...= 0 + N\left\langle r_e^2 \right\rangle = N\left\langle r_e^2 \right\rangle$, that is:

$\left\langle (R_{Univ}^{N})^2 \right\rangle = N\left\langle r_e^2 \right\rangle$, from which, by taking the square roots of both sides:

$\sqrt{\left\langle (R_{Univ}^{N})^2 \right\rangle} = R_{Univ} = \sqrt{N}\sqrt{\left\langle r_e^2 \right\rangle} = \sqrt{N} \cdot r_e$, that is:

$R_{Univ} = \sqrt{N} \cdot r_e$!

4- The Hooke's Law and the Universe.

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

$$k_e = -\frac{1}{4\pi\varepsilon_0}\frac{e^2}{r_e^3} = -1{,}027 \cdot 10^{16}\, N/m$$

$$k_{Univ} = -G\frac{m_e M_{Univ}}{R_{Univ}^3}$$

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

$$N = M_{Univ}/m_e . \tag{4.1}$$

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

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

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

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

$-\dfrac{1}{4\pi\varepsilon_0}\dfrac{e^2}{r_e^3} = -NG\dfrac{m_e M_{Univ}}{R_{Univ}^3}$, that is: $\dfrac{1}{4\pi\varepsilon_0}\dfrac{e^2}{r_e^3} = G\dfrac{m_e M_{Univ}}{R_{Univ}}\dfrac{1}{R_{Univ}^2/N} = G\dfrac{m_e M_{Univ}}{R_{Univ}}\dfrac{1}{r_e^2}$, from which:

$$\frac{1}{4pe_0}\frac{e^2}{r_e} = G\frac{m_e M_{Univ}}{R_{Univ}}$$ and, according to (3.5):

$$m_e c^2 = \frac{1}{4pe_0}\frac{e^2}{r_e} = G\frac{m_e M_{Univ}}{R_{Univ}}, \tag{4.2}$$

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.

Nowadays' cosmology figures out the radius of the Universe as:

$$R_{Univ} \approx 4000Mpc \approx 13{,}5 \cdot 10^9 light\_years \tag{5.1}$$

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

$H = v/d$, H is the Hubble's Constant:

$$H \cong 75km/(s \cdot Mpc) \cong 2{,}338 \cdot 10^{-18}[(\frac{m}{s})\big/m] \tag{5.2}$$

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

$H \approx c/R_{Univ}$, from which: $R_{Univ} \approx c/H \approx 4000Mpc \approx 13{,}5 \cdot 10^9 light\_years$ (5.3)

which is the (5.1), indeed.

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:

$$T_{Univ} \approx 13{,}5 \cdot 10^9 years \tag{5.4}$$

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:

$$M_{Univ} = c^3/(G \cdot H) \cong 1{,}67 \cdot 10^{53} kg \tag{5.6}$$

The corresponding value of density ρ, for the Universe which comes out, is:

$$r = M_{Univ}/(\frac{4}{3}pR_{Univ}^3) = (c^3/GH)\Big/[\frac{4}{3}p(\frac{c}{H})^3] = H^2/(\frac{4}{3}pG) \cong 2 \cdot 10^{-26} kg/m^3 \text{ (too high!)} \tag{5.7}$$

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:

$r = 2.32273 \cdot 10^{-30} kg/m^3$, 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:

$$R_{Univ-New} \cong 100R_{Univ} \cong 1{,}17908 \cdot 10^{28} m \tag{5.8}$$

$$M_{Univ-New} \cong 100M_{Univ} \cong 1{,}59486 \cdot 10^{55} kg \tag{5.9}$$

we get:

$$r = M_{Univ-New}/(\frac{4}{3}p \cdot R_{Univ-New}^3) = 2.32273 \cdot 10^{-30} kg/m^3 \quad ! \tag{5.10}$$

which is the right measured density!

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

$$c^2 = \frac{GM_{Univ}}{R_{Univ}} \quad ! \quad \text{(~Eddington)} \tag{5.11}$$

About the new T_{Univ} of the Universe, we know from physics that: v=ωR and $w = 2p / T$, and, for the whole Universe: c=ωR_{Univ} and $w = 2p / T_{Univ}$, from which:

$$T_{Univ} = \frac{2pR_{Univ}}{c} = 2{,}47118 \cdot 10^{20} s \qquad \text{(7.840 billion years)} \qquad (5.12)$$

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:

$$T_{Univ-wrong} = \frac{2pR_{Univ-wrong}}{c} = 2{,}67 \cdot 10^{18} s \text{ (that is, the time in the (5.4) extended to a complete cycle)} \qquad (5.13)$$

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 invisibile 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 background acceleration g (a_{Univ}).
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.

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:

$$l_{\max} = \frac{C}{T} = \frac{0{,}2897 \cdot 10^{-2}}{T} = 1{,}06 \cdot 10^{-3} \quad [m] \qquad \text{(Wien's Law)} \qquad (6.1)$$

($C = 0{,}2897 \cdot 10^{-2}\ [K \cdot m]$ it is the Wien's Constant)

from which: $T = \frac{C}{l} = \frac{0{,}2897 \cdot 10^{-2}}{1{,}06 \cdot 10^{-3}} \cong 2{,}73K$.

If now we use the Stephan-Boltzmann's Law: $e = sT^4$ [W/m^2] ($s = 5{,}67 \cdot 10^{-8} W/(m^2K^4)$), it can be also rewritten in the following way:

$$\frac{L_{Univ}}{4pR_{Univ}{}^2} = sT^4$$, where $L_{Univ} = \frac{M_{Univ}c^2}{T_{Univ}}$ is the power, in watt, for the Universe shown in many universities.

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

$$T = (\frac{L_{Univ}}{4pR_{Univ}{}^2 s})^{1/4} = (\frac{\frac{M_{Univ}c^2}{T_{Univ}}}{4pR_{Univ}{}^2 s})^{1/4} \neq 2{,}73K$$ (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 moe consistent data from my Universe, that is the (5.8), (5.9) and (5.12), we have:

$$L_{Univ} = \frac{M_{Univ}c^2}{T_{Univ}} = 5{,}80 \cdot 10^{51} W$$, from which, according to Stephan-Boltzmann:

$$T = (\frac{L_{Univ}}{4pR_{Univ}{}^2 s})^{1/4} \cong 2{,}73K$$!!!!!!!!!

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_{Univ} , we get a power which is exactly ½ of Planck's constants, expressed in watt!
In fact:

$$L_e = \frac{m_e c^2}{T_{Univ}} = \frac{1}{2} h_W = 3{,}316 \cdot 10^{-34} W \tag{6.2}$$

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

In fact, $L_{Univ} = \frac{M_{Univ}c^2}{T_{Univ}} = 5{,}80 \cdot 10^{51} W$ (by definition) and it's so true that:

$$\frac{L_{Univ}}{M_{Univ}} = \frac{\frac{M_{Univ}c^2}{T_{Univ}}}{M_{Univ}} = \frac{c^2}{T_{Univ}} = \frac{L_e}{m_e} = \frac{\frac{m_e c^2}{T_{Univ}}}{m_e} = \frac{c^2}{T_{Univ}} = \frac{\frac{1}{2}h_W}{m_e}$$ and, according to Stephan-Boltzmann's law, we can consider that both an "electron" and the Universe have got the same temperature, the cosmic microwave background one:

$$\frac{L}{4pR^2} = sT^4$$, from which: $$T = (\frac{L}{4pR^2 s})^{1/4} = (\frac{L_{Univ}}{4pR_{Univ}{}^2 s})^{1/4} = (\frac{L_e}{4pr_e{}^2 s})^{1/4} = (\frac{\frac{1}{2}h}{4pr_e{}^2 s})^{1/4} \cong 2{,}73K \ ! \tag{6.3}$$

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 $E=m_e c^2$ ant its electrostatic one, imagined on its surface (in a classic sense):

$$m_e \cdot c^2 = \frac{1}{4pe_0}\frac{e^2}{r_e}$$, so: (7.1)

$$r_e = \frac{1}{4pe_0}\frac{e^2}{m_e \cdot c^2} \cong 2{,}8179 \cdot 10^{-15} m\,.$$

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:

$m_x \cdot g_e = G\dfrac{m_x \cdot m_e}{r_e^2}$, from which:

$$g_e = G\frac{m_e}{r_e^2} = 8p^2 e_0^2 \frac{Gm_e^3 c^4}{e^4} (= a_{Univ}) = 7{,}62 \cdot 10^{-12}\, m/s^2 \tag{7.2}$$

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_{Univ} of the collapse of the Universe directly from the new values of radius and mass of the Universe, shown on page 10; in fact:

$a_{Univ} = \dfrac{c^2}{R_{Univ-New}} = 7{,}62 \cdot 10^{-12}\, m/s^2$, (as we know, from physics, that $a = \dfrac{v^2}{r}$) and:

$a_{Univ} = G \cdot M_{Univ-New} / R^2_{Univ-New} = 7{,}62 \cdot 10^{-12}\, m/s^2$ (from the Newton's Universal Law of Gravitation)

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

Fig. 7.1: Coma cluster.

Above Fig. 7.1 is a picture of the Coma cluster, about which hundreds of measurements are available; well, we know the following data about it:

distance Δx=100 Mpc = 3,26 10^8 l.y. = 3,09 10^{24} m

speed Δv=6870 km/s=6,87 10^6 m/s.

Then, from physics, we know that:

$\Delta x = \dfrac{1}{2} a \cdot \Delta t^2 = \dfrac{1}{2}(a \cdot \Delta t) \cdot \Delta t = \dfrac{1}{2}\Delta v \cdot \Delta t$, from which: $\Delta t = \dfrac{2 \cdot \Delta x}{\Delta v}$, which, if used in the definition of acceleration a_{Univ} , yields:

$$a_{Univ} = \frac{\Delta v}{\Delta t} = \frac{\Delta v}{\frac{2 \cdot \Delta x}{\Delta v}} = \frac{(\Delta v)^2}{2 \cdot \Delta x} = a_{Univ} \cong 7{,}62 \cdot 10^{-12} m/s^2, \quad \text{cosmic acceleration} \tag{7.3}$$

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: $g_e = a_{Univ}$ 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 invisibile 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 dnse 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 plausibile 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_{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_{Univ} is, as chance would have it, the same size of the gravitational acceleration at the borders of objects as big as galaxies.

Fig. 7.2: Andromeda galaxy (M31).

Andromeda galaxy (M31):

Distance: 740 kpc; R_{Gal}=30 kpc;
Visible Mass $M_{Gal} = 3\ 10^{11} M_{Sun}$;
Suspect Mass (+Dark) $M_{+Dark} = 1{,}23\ 10^{12} M_{Sun}$;
$M_{Sun}=2\ 10^{30}$ kg; 1 pc= $3{,}086\ 10^{16}$ m;

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

$m_{star}\dfrac{v^2}{R_{Gal}} = G\dfrac{m_{star}M_{Gal}}{R_{Gal}^2}$, from which: $v = \sqrt{\dfrac{GM_{Gal}}{R_{Gal}}}$

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

$v = \sqrt{\dfrac{GM_{Gal}}{R_{Gal}} + a_{Univ}R_{Gal}}$; let's figure out, for instance, in M31, how many R_{Gal} (how many k times) far away from the center of the galaxy the contribution from a_{Univ} can save us from supposing the existence of dark matter:

$\sqrt{\dfrac{GM_{+Dark}}{kR_{Gal}}} = \sqrt{\dfrac{GM_{Gal}}{kR_{Gal}} + a_{Univ}kR_{Gal}}$, so: $k = \sqrt{\dfrac{G(M_{+Dark} - M_{Gal})}{a_{Univ}R_{Gal}^2}} \cong 4$, therefore, at $4R_{Gal}$ far away, the existence of a_{Univ} makes us obtain the same high speeds observed, without any dark matter. Moreover, at $4R_{Gal}$ far away, the contribution due to a_{Univ} is dominant.

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

$G\dfrac{M_{Sun}}{R_{Earth-Sun}} \cong 8{,}92 \cdot 10^8 >> a_{Univ}R_{Earth-Sun} \cong 1{,}14$.

All these considerations on the link between a_{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_{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 $R_{Milky\ Way}$ 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 tents or hundreds of $R_{Milky\ Way}$, 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:

$\dfrac{GM_{M31}}{R_{Gal-Max}} = a_{Univ}R_{Gal-Max}$, from which:

$$R_{Gal-Max} = \sqrt{\frac{GM_{M31}}{a_{Univ}}} \cong 2{,}5R_{M31}; \qquad (7.4)$$

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.

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:

$$\frac{1}{4pe_0}\cdot\frac{e^2}{r_e}=\frac{GM_{Univ}m_e}{R_{Univ}} \quad ! \qquad \text{(which is the (4.2) already proved)} \qquad (8.1)$$

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

$a=\frac{1}{137}=\frac{\frac{1}{4pe_0}e^2}{\frac{h}{2p}c}$, but we also see that $\frac{1}{137}$ is given by the following equation, which can be considered suitable, as well, as the Fine Structure Constant:

$$a=\frac{1}{137}=\frac{\frac{Gm_e^2}{r_e}}{hn_{Univ}} \text{, where } n_{Univ}=\frac{1}{T_{Univ}} \qquad (T_{Univ} \text{ is the new one, just obtained in (5.12)!}) \qquad (8.2)$$

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:

$$(a=\frac{1}{137})=\frac{\frac{1}{4pe_0}e^2}{\frac{h}{2p}c}=\frac{\frac{Gm_e^2}{r_e}}{hn_{Univ}} \text{, from which: } \frac{1}{4pe_0}e^2=\frac{c}{2pn_{Univ}}\frac{Gm_e^2}{r_e}=R_{Univ}\frac{Gm_e^2}{r_e}$$

Therefore, we can write: $\frac{1}{4pe_0}\frac{e^2}{R_{Univ}}=\frac{Gm_e^2}{r_e}$.

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: $\frac{1}{4pe_0}\frac{e^2}{R_{Univ}}=\frac{GM_{Univ}m_e}{\sqrt{N}\sqrt{N}r_e}$, or also:

$$\frac{1}{4pe_0}\cdot\frac{e^2}{(R_{Univ}/\sqrt{N})}=\frac{GM_{Univ}m_e}{\sqrt{N}r_e} . \qquad (8.3)$$

If now we suppose that $R_{Univ}=\sqrt{N}r_e$ (8.4)

or, by the same token, $r_e=R_{Univ}/\sqrt{N}$, then (8.3) becomes: $\frac{1}{4pe_0}\cdot\frac{e^2}{r_e}=\frac{GM_{Univ}m_e}{R_{Univ}}$! that is (8.1) again.

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:

$N=\frac{M_{Univ}}{m_e}\cong 1{,}75\cdot 10^{85}$ (~Eddington), from which: $\sqrt{N}\cong 4{,}13\cdot 10^{42}$ (~Weyl) and

$R_{Univ}=\sqrt{N}r_e\cong 1{,}18\cdot 10^{28}\,m$, 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_{Univ} for a very long time T_{Univ} and through a long travel R_{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 $\frac{GM_{Univ}m_e}{R_{Univ}}$, 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_ec^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_ec^2:

$$m_ec^2 = \frac{1}{4pe_0}\cdot\frac{e^2}{r_e} = \frac{GM_{Univ}m_e}{R_{Univ}}.$$

The directly proof the equation (8.4) $R_{Univ} = \sqrt{N}r_e$ has been already given on page 8.

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

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:

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

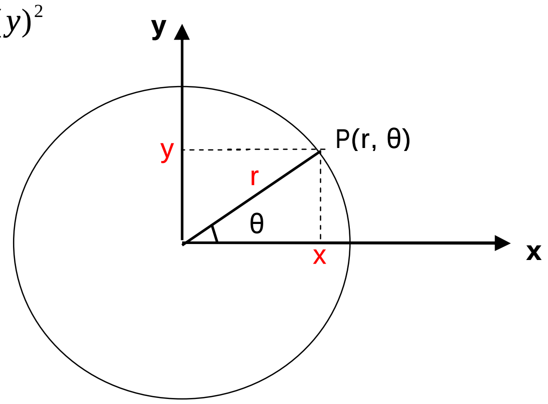


Fig. 9.1.
Then, by studying the geometry in three dimensions, a new version of the Pythagorean Theorem comes out:

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

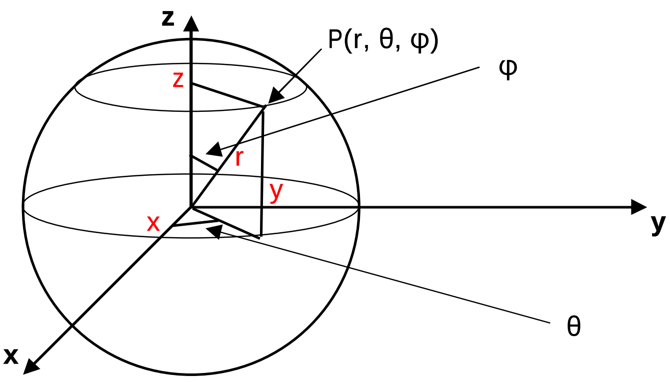


Fig. 9.2.

If now we want to go on towards a mysterious 4-dimensional situation, then we would expect a version like the following one:

$$(r)^2 = (x)^2 + (y)^2 + (z)^2 + (x_4)^2$$

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

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

$$(r)^2 = (x)^2 + (y)^2 + (z)^2 - (x_4)^2 \qquad (9.1)$$

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 mc^2.
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: $c^2t^2 - v^2t^2 = x_4^2 - \vec{x}^2$, 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 <u>space</u> from home to my job place corresponds to the <u>space</u> 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 infinite etc).
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 eather 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.

<u>Now we prove that the Theory of Relativity is just an interpretation of the oscillating Universe just described, contracting with speed c:</u>

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:

$v_1 = 0$ 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 $\Delta_{\uparrow}E$ (delta up) is:

$\Delta_{\uparrow}E = E_2 - E_1 = \frac{1}{2}mv_2^2 - 0 = \frac{1}{2}m(v_2 - 0)^2 = \frac{1}{2}m(\Delta v)^2$, with $\Delta v = v_2 - v_1$.

Now, we've obtained a Δv 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: $\Delta_{\uparrow}E = E_2 - E_1 = \frac{1}{2}mv_2^2 - \frac{1}{2}mv_1^2 = \frac{1}{2}m(v_2^2 - v_1^2) = \frac{1}{2}m(\Delta_V v)^2$, where Δ_V is a vectorial delta: $\Delta_V v = \sqrt{(v_2^2 - v_1^2)}$; 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:

$$V = \Delta_V v = \sqrt{(c^2 - v^2_{New-Abs-Univ-Speed})}\ , \tag{10.1}$$

where $v_{New-Abs-Univ-Speed}$ 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, <u>in a spring</u> which has a mass on one of its ends, for the <u>harmonic motion</u> law, the speed follows a harmonic law like:

$v = (wX_{Max})\sin a = V_{Max}\sin a \quad (v_{New-Abs-Univ-Speed} = c\sin a$, in our case),

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

$E = E_{Max}\sin a \quad (m_0c^2 = (m_0c^2 + E_K)\sin a$, in our case),

we get $\sin a$ from the two previous equations and equal them, so getting:

$$v_{New-Abs-Univ-Speed} = c\frac{m_0c^2}{m_0c^2 + E_K}\ ,$$

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

$V = \Delta_V v = \sqrt{(c^2 - v^2_{New-Abs-Univ-Speed})} = \sqrt{[c^2 - (c\frac{m_0c^2}{m_0c^2 + E_K})^2]} = V$, 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:

$$E_K = m_0 c^2 \left(\frac{1}{\sqrt{1-\frac{V^2}{c^2}}} - 1\right)$$! 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:

$$E = E_K + m_0 c^2 = m_0 c^2 + m_0 c^2 \left(\frac{1}{\sqrt{1-\frac{V^2}{c^2}}} - 1\right) = \frac{1}{\sqrt{1-\frac{V^2}{c^2}}} m_0 c^2 = g \cdot m_0 c^2$$, that is the well known

$E = g \cdot m_0 c^2$ (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:

$$E = \frac{1}{g} \cdot m_0 c^2 \quad \text{(Rubino)} \tag{10.3}$$

which is intuitive just for the simple reason that, with the increase of the speed, the coefficient $1/g$ 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). For a convincing proof of (10.3) and of some of its implications, I have further files about.

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 12, already, we saw the gravity acceleration on an electron is equal to the cosmic acceleration a_{Univ}

Moreover, by the (6.3) at page 12 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 21-22).

Now, as its period is not infinite, its frequency is not zero and all the frequencies in the Universe must be a multiple of it, 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_{Univ} accelerating Universe, collapsing with speed c; according to this principle, the product Δx Δp must keep above $\mathbf{h}/2$, and with the equal sign, when Δx is at a maximum, Δp must be at a minimum, and vice versa:

$\Delta p \cdot \Delta x \geq \mathbf{h}/2$ and $\Delta p_{max} \cdot \Delta x_{min} = \mathbf{h}/2$ $(\mathbf{h} = h/2p)$

Now, as Δp_{max} we take, for the electron ("stable" and base particle in our Universe!), $\Delta p_{max} = (m_e \cdot c)$ and as Δx_{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: $\Delta x_{\min} = a_{Univ} / (2p)^2$, as a direct consequence of the characteristics of the Universe in which it is; in fact, $R_{Univ} = a_{Univ} / w_{Univ}^2$, as we know from physics that $a = w^2 R$, and then $w_{Univ} = 2p / T_{Univ} = 2pn_{Univ}$, and as w_e of the electron (which is a harmonic of the Universe) we therefore take the "n_{Univ} –th" part of w_{Univ} , that is:

$|w_e| = |w_{Univ} / n_{Univ}|$ 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 the (global) Hubble Constant, but through H_{Global} divided by n_{Univ} , and so, if for the whole Universe: $R_{Univ} = a_{Univ} / w_{Univ}^2$, then, for the electron:

$$\Delta x_{\min} = \frac{a_{Univ}}{(w_e)^2} = \frac{a_{Univ}}{(|w_{Univ} / n_{Univ}|)^2} = \frac{a_{Univ}}{(2p)^2}$$, from which:

$$\Delta p_{\max} \cdot \Delta x_{\min} = m_e c \frac{a_{Univ}}{(2p)^2} = 0{,}527 \cdot 10^{-34} \text{ [Js]} \qquad (12.1)$$

and such a number ($0{,}527 \cdot 10^{-34}$ Js), as chance would have it, is really $\mathbf{h}/2$!!

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 $E = g \cdot m_0 c^2$ 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: $E = \frac{1}{g} \cdot m_0 c^2$ (Rubino) , not existing in the Einstein's STR.

By using (10.3) in Atomic Physics, in order to figure out the ionization energies $\Delta_{\downarrow} E_Z$ 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:

$$\Delta_{\downarrow} E_Z = m_e c^2 [1 - \sqrt{1 - (\frac{Ze^2}{2e_0 hc})^2}\,] \qquad (13.1)$$

and for atoms with a generic quantum number n and generic orbits:

$$\Delta_{\downarrow} E_{Z-n} = m_e c^2 [1 - \sqrt{1 - (\frac{Ze^2}{4ne_0 hc})^2}\,] \quad \text{(Wåhlin)} \qquad (13.2)$$

Orbit (n)	Energy (J)	Orbit (n)	Energy (J)
1	2,1787 10^{-18}	5	8,7147 10^{-20}
2	5,4467 10^{-19}	6	6,0518 10^{-20}
3	2,4207 10^{-19}	7	4,4462 10^{-20}
4	1,3616 10^{-19}	8	3,4041 10^{-20}

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 $E = g \cdot m_0 c^2$ 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.

Again, in order to have clear proofs of (13.1) and (13.2), I have further files about.

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 existance 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 methaphysics one is not taken, as I take it here, on the contrary. Let's not forget, indeed, that the methaphysical 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 ΔE, is legitimated to appear anyhow, unless it lasts less than Δt, 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 eather 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.

Thank you for your attention.

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Appendix: Physical Constants.

Boltzmann's Constant k: $1{,}38 \cdot 10^{-23} J / K$

Cosmic Acceleration a_{Univ}: $7{,}62 \cdot 10^{-12} m / s^2$

Distance Earth-Sun AU: $1{,}496 \cdot 10^{11} m$

Mass of the Earth M_{Earth}: $5{,}96 \cdot 10^{24} kg$

Radius of the Earth R_{Earth}: $6{,}371 \cdot 10^{6} m$

Charge of the electron e: $-1{,}6 \cdot 10^{-19} C$

Number of electrons equivalent of the Universe N: $1{,}75 \cdot 10^{85}$

Classic radius of the electron r_e: $2{,}818 \cdot 10^{-15} m$

Mass of the electron m_e: $9{,}1 \cdot 10^{-31} kg$

Finestructure Constant $a\,(\cong 1/137)$: $7{,}30 \cdot 10^{-3}$

Frequency of the Universe n_0: $4{,}05 \cdot 10^{-21} Hz$

Pulsation of the Universe $w_0 (= H_{global})$: $2{,}54 \cdot 10^{-20}\ rad/s$

Universal Gravitational Constant G: $6{,}67 \cdot 10^{-11} Nm^2 / kg^2$

Period of the Universe T_{Univ}: $2{,}47 \cdot 10^{20} s$

Light Year l.y.: $9{,}46 \cdot 10^{15} m$

Parsec pc: $3{,}26\_a.l. = 3{,}08 \cdot 10^{16} m$

Density of the Universe ρ_{Univ}: $2{,}32 \cdot 10^{-30} kg / m^3$

Microwave Cosmic Radiation Background Temp. T: $2{,}73 K$

Magnetic Permeability of vacuum μ_0: $1{,}26 \cdot 10^{-6} H / m$

Electric Permittivity of vacuum ε_0: $8{,}85 \cdot 10^{-12} F / m$

Planck's Constant h: $6{,}625 \cdot 10^{-34} J \cdot s$

Mass of the proton m_p: $1{,}67 \cdot 10^{-27} kg$

Mass of the Sun M_{Sun}: $1{,}989 \cdot 10^{30} kg$

Radius of the Sun R_{Sun}: $6{,}96 \cdot 10^{8} m$

Speed of light in vacuum c: $2{,}99792458 \cdot 10^{8} m / s$

Stephan-Boltzmann's Constant σ: $5{,}67 \cdot 10^{-8} W / m^2 K^4$

Radius of the Universe (from the centre to us) R_{Univ}: $1{,}18 \cdot 10^{28} m$

Mass of the Universe (within R_{Univ}) M_{Univ}: $1{,}59 \cdot 10^{55} kg$

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