WHAT A COINCIDENCE! STRANGE NUMERICAL LINKS IN THE UNIVERSE

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ABSTRACT

In this paper you will find ten examples of numerical coincidences among the physical quantities of the universe.
Unfortunately, you will unlikely find them somewhere else, as most of them are here presented in an environment which is hostile to the prevailing cosmology, made of an unjustifiable (thick, dark, transparent, heavy and invisible!!!) dark matter, of unacceptable theoretical densities of the universe and unacceptable rotation speeds on galaxies.

INTRODUCTION

Fig. 1.1 below 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.

From Hubble's observations on, we understood far galaxies and clusters got farther with speeds determined by measurements of the red shift. Not only; the farthest ones have got higher speeds and it quite rightly seems there's a law between the distance from us of such objects and the speeds by which they get farther from us: the Hubble's law.

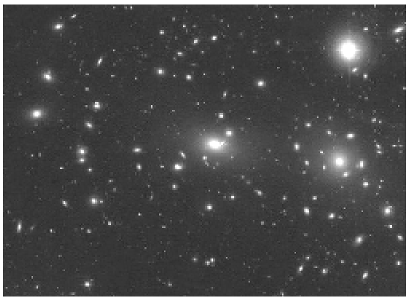


Fig. 1.1: Coma cluster.

If we use data on Coma cluster to figure out the Hubble's constant, we get:

$$H_{local} = \Delta v \Big/ \Delta x \cong 2{,}22 \cdot 10^{-18} [(\frac{m}{s}) \Big/ m], \qquad (1.1)$$

That is a good value for "local" Hubble's constant, still used today by the prevailing cosmology.
We also get the same H local value if we use data on the visible Universe of 13,5 10^9 l.y. radius (Δx) and ~c speed (Δv).

Here is a remark Hubble didn't likely do: if galaxies increase their own speeds with going farther, then they are accelerating with an acceleration we call a_{Univ}, and, 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_{Univ}, yields:

$$a_{Univ} = \frac{\Delta v}{\Delta t} = \frac{\Delta v}{\frac{2 \cdot \Delta x}{\Delta v}} = \frac{(\Delta v)^2}{2 \cdot \Delta x} = a_{Univ} \cong 7{,}62 \cdot 10^{-12} m/s^2, \text{ cosmic acceleration} \qquad (1.2)$$

after that we used data on Coma cluster.
This is the acceleration by which all our visible Universe is accelerating towards the center of mass of the whole Universe.
In fact, 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 want 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.
At last, I remind you 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.

Moreover, on abundances of U^{235} and U^{238} we see now (trans-CNO elements created during the explosion of the primary supernova, we see that (maybe) the Earth and the solar system are just (approximately) five or six billion years old, but all this is not against all what just said on the real age of the Universe, as there could have been sub-cycles from which galaxies and solar systems originated, whose duration is likely less than the age of the whole Universe.

If an event, after having had at its disposal an infinite time, hasn't happened yet, then it's because it can never happen.
In physics an infinite time is meaningless. The infinite is something you can just say and you can assign a symbol, but it can be neither imagined nor really handled.
In mathematics they talk about a tendency to infinite; just a tendency. The Universe cannot be born an infinite time ago; and so, what was before it? Well, we cannot say there isn't any answer, but rather we can say this question is wrong. Time was born together with the Universe and in the Universe, so the expression "before the Universe" is a contradiction. It exists since the moment when it started to exist and that's it. Or better, it exists and that's it. Rather, there is something more interesting: to understand how the Universe can "appear" without violating the conservation laws and laws of physics in general; on this purpose, see my links on point 1 in bibliography.
Anyway, as the world wasn't born an infinite time ago, collapsing matter cannot come from an infinite distance; therefore, hundreds of billions years ago there was an expansion (post Big Bang), in the opposite direction with respect to the collapse we have now, and so all that with a repulsive gravity. On the basis of all that, the Universe is cyclic and so it has a cyclic frequency and this is the right key to understand why it is quantized! All the frequencies which are in the Universe must so be, directly or indirectly, a multiple of the Universe one and this one is the smallest existing frequency; on this purpose, see the files at my links on point 1 in bibliography.

Now, we say the Universe is 100 times bigger and heavier than the one of the prevailing cosmology:

$$R_{Univ-New} \cong 100 R_{Univ} \cong 1{,}17908 \cdot 10^{28} m \qquad (1.3)$$

$$M_{Univ-New} \cong 100 M_{Univ} \cong 1{,}59486 \cdot 10^{55} kg \qquad (1.4)$$

This value of radius is 100 times the one previously calculated in the prevailing cosmology and it should represent the radius between the center of mass of the Universe and the place where we are now, place in which the speed of light is c.

((as we are not exactly on the edge of such a Universe, we can demonstrate the whole radius is larger by a factor $\sqrt{2}$, that is R_{Univ}=1,667 10^{28}m.))
Anyway, we are dealing with linear dimensions 100 times those supported in the prevailing cosmology nowadays. We can say that there is invisible matter, but it is beyond the range of our largest telescopes and not inside galaxies or among them; the dark matter should upset laws of gravitations, but they hold very well.

By these new bigger values, we also realize that:

$$c^2 = \frac{GM_{Univ}}{R_{Univ}} \quad ! \qquad (1.5)$$

By the assumptions in the (1.3) and (1.4), we get:

$$r = M_{Univ-New} / (\frac{4}{3} p \cdot R^3_{Univ-New}) = 2.32273 \cdot 10^{-30} kg / m^3 \quad ! \qquad (1.6)$$

which is the right density, measured by the astrophysicists!

The prevailing cosmology, on the contrary, comes to the following value:

$r_{Wrong} = H^2_{local} / (\frac{4}{3} pG) \cong 2 \cdot 10^{-26} kg / m^3$ (too high value, from which their search for the mysterious dark matter!)

We also see that:

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

as well as:

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

FIRST NUMERICAL LINK (the cosmic acceleration is equal to the gravitational acceleration on an electron):

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):

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

$$r_e = \frac{1}{4pe_0}\frac{e^2}{m_e \cdot c^2} \cong 2{,}8179 \cdot 10^{-15} m \qquad (1.7)$$

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: $m_x \cdot g_e = G\frac{m_x \cdot m_e}{r_e^2}$, so:

$$g_e = G\frac{m_e}{r_e^2} = 8p^2 e_0^2 \frac{G m_e^3 c^4}{e^4} = a_{Univ} = 7{,}62 \cdot 10^{-12}\, m/s^2 \qquad (1.8)$$

that is the very value obtained in (1.2) through different reasonings, macroscopic, and not microscopic, as it was for (1.8). All in all, why should gravitational behaviours of the Universe and of electrons (making it) be different?

SECOND NUMERICAL LINK (on the Universe, the electron and the Planck's Constant):

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

$$T_{Univ} = \frac{2pR_{Univ}}{c} = 2{,}47118 \cdot 10^{20} s \qquad \text{(7.840 billion years)} \qquad (1.9)$$

About the angular frequency: $w_{Univ} = H_{Global} \cong c/R_{Universo-New} = 2{,}54 \cdot 10^{-20} rad/s$

Let's remind ourselves of the Stephan-Boltzmann's law (see my links on point 1, in the bibliography):

$e = sT^4$ [W/m^2], where $s = 5{,}67 \cdot 10^{-8}\, W/(m^2 K^4)$

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:

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

(One must not be surprised by the coefficient ½; in fact, at fundamental energy levels, it's always present, such as, for instance, on the first orbit of the hydrogen atom, where the circumference of the orbit of the electron (2πr) really is $\frac{1}{2} l_{DeBroglie}$ of the electron. The photon, too, can be represented as if it were contained in a small cube whose side is $\frac{1}{2} l_{photon}$).

THIRD NUMERICAL LINK (the Universe and the electron have got the same luminosity – mass ratios and the same Cosmic Microwave Background Radiation Temperature):

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:

$$\frac{L}{4pR^2} = sT^4 \text{, so: } T = (\frac{L}{4pR^2 s})^{1/4} = (\frac{L_{Univ}}{4pR_{Univ}{}^2 s})^{1/4} = (\frac{L_e}{4pr_e{}^2 s})^{1/4} = (\frac{\frac{1}{2}h}{4pr_e{}^2 s})^{1/4} = 2{,}73K$$

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

FOURTH NUMERICAL LINK (The Heisenberg' Indetermination Principle is a direct consequence of the oscillation of the Universe):

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 $\Delta p_{\max}$ we take, for the electron ("stable" and base particle in our Universe!), $\Delta p_{\max} = (m_e \cdot c)$ and as $\Delta x_{\min}$ 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:

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

$\Delta p_{\max} \cdot \Delta x_{\min} = m_e c \frac{a_{Univ}}{(2p)^2} = 0{,}527 \cdot 10^{-34}$ [Js] and such a number ($0{,}527 \cdot 10^{-34}$ Js), as chance would have it, is really $\mathbf{h}/2$!!

FIFTH NUMERICAL LINK (The Fine Structure Constant justifies a 100 times older Universe):

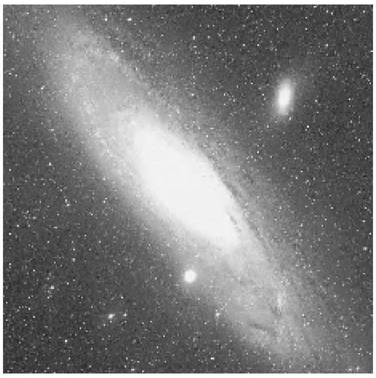
We know that $a = \frac{1}{137}$ is the value of the Fine Structure Constant and the following formula $\frac{Gm_e^2}{r_e} \Big/ hn$ yields the same value <u>only if</u> n is the one of the Universe we just described, that is: $a = \frac{1}{137} = \frac{Gm_e^2}{r_e} \Big/ hn_{Univ}$, where, clearly: $n_{Univ} = \frac{1}{T_{Univ}}$ (see (1.9))

SIXTH NUMERICAL LINK (The strong link between the radius of the electron, that of the Universe and the number of electrons in the Universe):

If I suppose, out of simplicity, that the Universe is made of just harmonics, as electrons e^- (and/or positrons e^+), their number will be: $N = \frac{M_{Univ}}{m_e} \cong 1{,}75 \cdot 10^{85}$ (~Eddington); the square root of such a number is: $\sqrt{N} \cong 4{,}13 \cdot 10^{42}$ (~Weyl).

Now, we are surprised to notice that $\sqrt{N} r_e \cong 1{,}18 \cdot 10^{28} m$ (!), that is, the very R_{Univ} value we had in (1.3) ($R_{Univ} = \sqrt{N} r_e \cong 1{,}18 \cdot 10^{28} m$)

SEVENTH NUMERICAL LINK (The tidal effect of the Universe on single galaxies matches the effect of the mysterious missing mass of the prevailing astrophysics):



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;

Fig. 1.2: Andromeda galaxy (M31).

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

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

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:

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

; 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:

$$\sqrt{\frac{GM_{+Dark}}{kR_{Gal}}}=\sqrt{\frac{GM_{Gal}}{kR_{Gal}}+a_{Univ}kR_{Gal}}\text{ , so: } k=\sqrt{\frac{G(M_{+Dark}-M_{Gal})}{a_{Univ}R_{Gal}^2}}\cong 4$$

, 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:

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

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:

$$\frac{GM_{M31}}{R_{Gal-Max}}=a_{Univ}R_{Gal-Max}\text{ , from which: } R_{Gal-Max}=\sqrt{\frac{GM_{M31}}{a_{Univ}}}\cong 2{,}5R_{M31}$$

; in fact, maximum radii ever observed in galaxies are roughly this size.

EIGHTH NUMERICAL LINK (The composition of all electric forces in the Universe matches the force of gravity of the Universe itself):

We remind you that from the definition of r_e in (1.7): $\frac{1}{4pe_0}\cdot\frac{e^2}{r_e}=m_ec^2$ and from the (1.5): $c^2=\frac{GM_{Univ}}{R_{Univ}}$, we get:

$$\frac{1}{4pe_0}\cdot\frac{e^2}{r_e}=\frac{GM_{Univ}m_e}{R_{Univ}} \quad !! \tag{1.10}$$

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

$\alpha = \frac{1}{137} = \frac{\frac{1}{4\pi\varepsilon_0}e^2}{\frac{h}{2\pi}c}$ (Alonso-Finn), 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:

$$\alpha = \frac{1}{137} = \frac{\frac{Gm_e^2}{r_e}}{h\nu_{Univ}}, \text{ where } \nu_{Univ} = \frac{1}{T_{Univ}} .$$

So, we could set the following equation and deduce the relevant consequences (Rubino):

$$(\alpha = \frac{1}{137}) = \frac{\frac{1}{4\pi\varepsilon_0}e^2}{\frac{h}{2\pi}c} = \frac{\frac{Gm_e^2}{r_e}}{h\nu_{Univ}}, \text{ from which: } \frac{1}{4\pi\varepsilon_0}e^2 = \frac{c}{2\pi\nu_{Univ}}\frac{Gm_e^2}{r_e} = \frac{c}{H_{global}}\frac{Gm_e^2}{r_e} = R_{Univ}\frac{Gm_e^2}{r_e}$$

after that (1.9) has been used.

Therefore, we can write: $\frac{1}{4\pi\varepsilon_0}\frac{e^2}{R_{Univ}} = \frac{Gm_e^2}{r_e}$ (and this intermediate equation, too, shows a deep relationship between electromagnetism and gravitation, but let's go on…)

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

or also: $$\frac{1}{4\pi\varepsilon_0}\cdot\frac{e^2}{(R_{Univ}/\sqrt{N})} = \frac{GM_{Univ}m_e}{\sqrt{N}r_e} . \qquad (1.11)$$

If now we suppose that $R_{Univ} = \sqrt{N}r_e$ (1.12)

or, by the same token, $r_e = R_{Univ}/\sqrt{N}$, then (1.11) becomes: $\frac{1}{4\pi\varepsilon_0}\cdot\frac{e^2}{r_e} = \frac{GM_{Univ}m_e}{R_{Univ}}$ that is (1.10) 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 and from (1.4) 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 obtained in (1.3).
For a direct proof of (1.12), see my proof in the links on point 1 in bibliography.

Now, (1.10) 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, or like if it were able to exert a special gravitational force, through a special Gravitational Universal Constant G', much bigger than G:

$(\frac{1}{4pe_0} \cdot \frac{e}{m_e} \cdot \frac{e}{m_e}) \cdot \frac{m_e m_e}{r_e} = G' \cdot \frac{m_e m_e}{r_e}$; it's only that during the sudden release of energy by the electron, there is a run taking effect due to its eternal free (gravitational) falling in the Universe. And, at the same time, gravitation is an effect coming from the composition of many small electric forces.

I also remark here, that the energy represented by (1.10), 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 $m_e c^2$:

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

NINETH NUMERICAL LINK (The electric effect of the relativistic Lorentz contraction in a conductor matches the appearing effect of a magnetic field):

Concerning this, let's examine the following situation, where we have a wire, of course made of positive nuclei and electrons, and also a cathode ray (of electrons) flowing parallel to the wire:

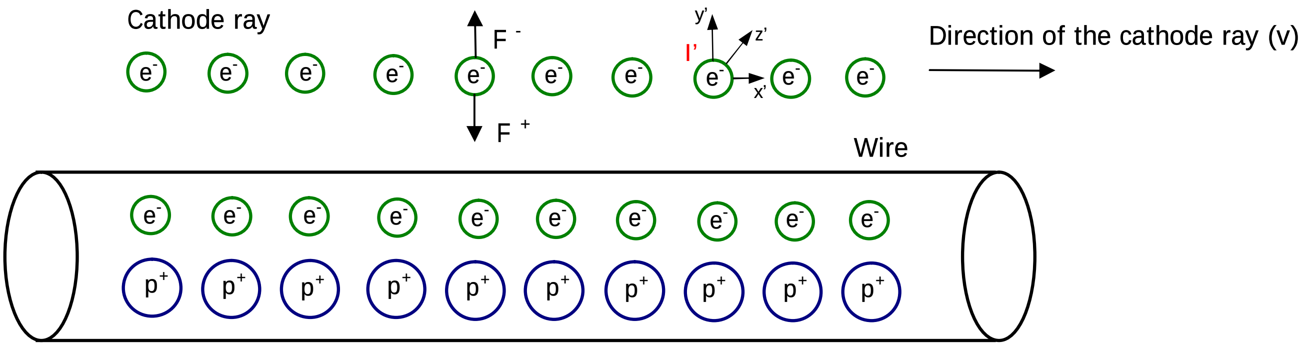


Fig. 1.3: Wire not flown by any current, seen from the cathode ray steady ref. system I' (x', y', z').

We know from magnetism that the cathode ray will not be bent towards the wire, as there isn't any current in it. This is the interpretation of the phenomenon on a magnetic basis; on an electric basis, we can say that every single electron in the ray is rejected away from the electrons in the wire, through a force F^- identical to that F^+ through which it's attracted from positive nuclei in the wire.

Now, let's examine the situation in which we have a current in the wire (e^- with speed u)

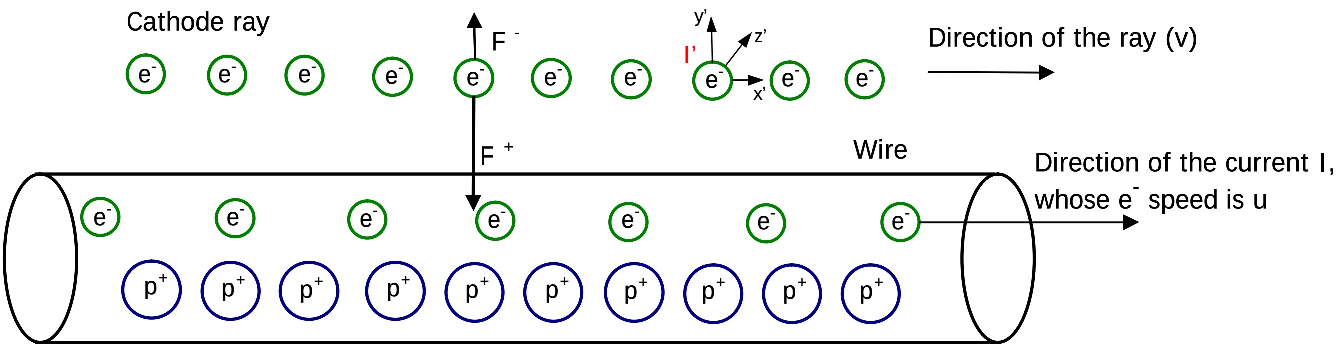


Fig. 1.4: Wire flown by a current (with e^- speed=u), seen from the cathode ray steady ref. system I' (x', y', z').

In this case we know from magnetism that the cathode ray must bend towards the wire, as we are in the well known case of parallel currents in the same direction, which must attract each other.

This is the interpretation of this phenomenon on a magnetic basis; on an electric basis, we can say that as the electrons in the wire follow those in the ray, they will have a speed lower than that of the positive nuclei, in the system I', as such nuclei are still in the wire. As a consequence of that, spaces among the electrons in the wire will undergo a lighter relativistic Lorentz contraction, if compared to that of the nuclei's, so there will be a lower negative charge density, if compared to the positive one, so electrons in the ray will be electrically attracted by the wire.

This is the interpretation of the magnetic field on an electric basis. Now, although the speed of electrons in an electric current is very low (centimeters per second), if compared to the relativistic speed of light, we must also acknowledge that the electrons are billions and billions…., so a small Lorentz contraction on so many spaces among charges, makes a substantial magnetic force to appear.

Now, for an analytical proof of all that, see my links on point 1 in bibliography.

TENTH NUMERICAL LINK (The equations of the Theory of Relativity and those of the oscillation of the collapsing Universe match each other):

For an analytical proof of all that, see my links on point 1 in bibliography.

The speed of a body in our oscillating Universe, now collapsing, must respect the following oscillation law:

$$V=\sqrt{[c^2-(c\frac{m_0c^2}{m_0c^2+E_K})^2]}$$ (rif. to my links above mentioned) (1.13)

If now we get E_K from (1.13), we'll have:

$$E_K=m_0c^2(\frac{1}{\sqrt{1-\frac{V^2}{c^2}}}-1)$$!!! which is exactly the relativistic Einstein's kinetic energy!

PHYSICAL CONSTANTS:

Boltzmann's Constant k: $1{,}38\cdot10^{-23}J/K$

Cosmic Acceleration a_{Univ}: $7{,}62\cdot10^{-12}m/s^2$

Distance Earth-Sun AU: $1{,}496\cdot10^{11}m$

Mass of the Earth M_{Earth}: $5{,}96\cdot10^{24}kg$

Radius of the Earth R_{Earth}: $6{,}371\cdot10^{6}m$

Charge of the electron e: $-1{,}6\cdot10^{-19}C$

Number of electrons equivalent of the Universe N: $1{,}75\cdot10^{85}$

Classic radius of the electron r_e: $2{,}818\cdot10^{-15}m$

Mass of the electron m_e: $9{,}1\cdot10^{-31}kg$

Fine structure Constant $a\,(\cong 1/137)$: $7{,}30\cdot10^{-3}$

Frequency of the Universe n_{Univ} : $4{,}05\cdot10^{-21}Hz$

Pulsation of the Universe $w_{Univ}(=H_{global})$: $2{,}54\cdot10^{-20}\ rad/s$

Universal Gravitational Constant G: $6{,}67\cdot10^{-11}Nm^2/kg^2$

Period of the Universe T_{Univ} : $2{,}47\cdot10^{20}s$

Light Year l.y.: $9{,}46\cdot10^{15}m$

Parsec pc: $3{,}26\_a.l.=3{,}08\cdot10^{16}m$

Density of the Universe ρ_{Univ}: $2{,}32\cdot10^{-30}kg/m^3$

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

Magnetic Permeability of vacuum μ_0: $1{,}26\cdot10^{-6}H/m$

Electric Permittivity of vacuum ε_0: $8{,}85\cdot10^{-12}F/m$

Planck's Constant h: $6{,}625\cdot10^{-34}J\cdot s$

Mass of the proton m_p: $1{,}67\cdot10^{-27}kg$

Mass of the Sun M_{Sun}: $1{,}989\cdot10^{30}kg$

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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Thank you for your attention.

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