**Abstract (1, 2).**

This article introduces in a simplified manner, for non-specialists, a new concept of Mass by extending the Principle of Equivalence of Einstein and the metrics of the $5^{th}$ dimension, deducing from it, a Unification Equation of Charges and Masses. It considers also some philosophical and existential consequences of those results.

**Foreword.**

The Saint Grail of XX c. physics was the search for a Unification Equation of all the forces of Nature. it remained to unify the forces of gravitation and electromagnetism.

'Mass' is an intrinsic property of matter, a vortex of gravitational forces, clearly expressed by Einstein's Principle of equivalence. So it is charge: a vortex of electromagnetic forces.

Under this result, the definition of both, masses and charges as 'cyclical clocks' of gravitational and electromagnetic forces of two different scales (the large scale of cosmological gravitation and the small scale of electromagnetic charges) allows an easy conversion of a gravitational and electromagnetic vortex using the simple Metrics of the 5th dimension for a tri-dimensional vortex.

This is a trivial result in 5D Metrics, using the simple concept of a fractal Universe structured in different scales of 'spatial size' and 'temporal information', in which 'clocks of time' accelerate, the smaller we become, but the product of both remains, expressed mathematically in its simple formulation by the Metrics of the 5th Dimension: Se x Ti = K.

This result allows the 'first' ever-theoretical deduction of the value of the G constant of masses, departing from the Q constant of charges. Both mean the same: the degree of space-time curvature produced by an Eddie of masses or charges in those scales of space-time.

It is however impossible to obtain departing from a single space-time continuum as Mr. Einstein or Mr. Hawking tried, by messing the lineal equations of electromagnetism and the cyclical equations of Relativity (what is called quantum gravity).

*So we shall deal here with:*

I. The concept of a charge and a mass as cyclical vortices of space-time of the two-fractal scales of micro-quantum particles and macro-cosmological ones.

With an Appendix on the Higgs claim to give 'mass' to other particles.

II. The mathematical, simple, trivial deduction with the metrics of the 5th Dimension of the equation of Unification of the two fundamental constants of Nature, Q and G.

III. Finally, we shall consider the implications of those facts - the parallelism between 'atoms' and 'galaxies', which as in the equations of space-time of Einstein-Walker (which treated galaxies as atoms), are 'similar' forms of two scales of the Universe

With an appendix on the philosophical consequences of this, according to a strong hypothesis of the Fractal Universe (scales which are mathematically equal in the 5D metrics are really equal).

Then in the 5D metrics a galaxy is an atom of the higher scale, a proton has the same Schwarzschild radius equation than a black hole, which should therefore be a top quark star, positively charged (as top quarks are ++) and dark matter in the halo is made of negatively charged strangelets, the equivalent to a nebulae of electrons. Which gives a role to the 3 families of quark mass and makes sense of the purpose of stars (future black holes) and planets (future strangelets – perhaps our destiny in the higher scale, if as all seems to indicate, the Fermi Paradox converts all planets into strangelets, as nuclear physicists make them with their experiments with quark matter condensates)…

## I. EINSTEIN'S MASS THEORY: THE STRONG PRINCIPLE OF EQUIVALENCE:

## MASS AS A VORTEX OF GRAVITATIONAL TIME.

*Mass is the attractive, in/forming force of merely the last, of the gravitational this with his the Universe; and it is accelerated, curved motion force. Einstein explained principle of equivalence between acceleration and mass/gravitation. Initially, due to the 'mirage' of materialism, physicists thought the principle only applied to the external, curving vortex of gravitational forces that sunk into the mass. But the mass as a solid substance was never found and all pictures have seen merely vortices of curved motions.*

*Now we can explain all this and take further, conceptually and mathematically the discoveries of Einstein, thanks to the advances of complexity. In this post we shall deal at the simplest possible level with empirical, theoretical and mathematical demonstrations of those concepts, considering some of the new advances on theory of information and astro-physics, we are making departing from Einstein's insight.*

### Einstein's mass theory

*I*n Physics, according to Einstein the information of a particle is its mass. This can be easily proved theoretically, mathematically and empirically.

In the previous pictures there is an obvious empirical proof. All pictures of masses and charges appear as vortices with an accelerated inward motion. Let us now deal with the other proofs (and let us remember that truth in epistemology of science is based in 3 pillars - empirical, logical and

mathematical proofs.

*Einstein's Conceptual proof.*

Now this simple equation is in accordance with Einstein's Principle of equivalence between acceleration and gravitational force. Both are *the same in General Relativity.* And so why we should stop this 'comparison' at a certain point of the accelerating vortex? Since in the Universe we have never seen 'substance' but only motions, it is logic to think that what we call a mass is exactly that: the final region of acceleration into a vortex of gravitational forces. Such vortex obviously offers a resistance to motion (inertial mass), which is dependent of the speed/acceleration of such motion.

*Einstein's Mathematical proof*

*The mathematical proof is simple, given by the 2 main equations of Einstein, which relate the frequency of information (a time parameter), the mass and the energy of physical systems:*

*ExT=K, E=Mc2, hence M=K/T=Kv; where v is the frequency of rotation of the vortex of mass.*

*Thus a mass is a vortex of space-time that carries the information of the Universe in its frequency.*

*This also has empirical proofs: All vortices attract inwards with a force equivalent to the strength of the rotating vortex. So a hurricane attract more when it turns faster. And so a mass, which is a hurricane of space-time attracts more the faster it turns. Moreover vortices of all kind are 'accelerating' inwards: Vo x Ro = K, which means that the shorter the radius is, Ro, the faster its speed, Vo, so the closer you come to the vortex, the faster it turns, the more it attracts, the stronger its gravitational force is, and the more mass it has.*

*B*ut what type of accelerated motion?  Well it turns out that there are only two accelerated motions, lineal and cyclical accelerations. Further on, accelerated motions can produce forces that 'work'. And Newton gave us a simple equation to describe 'all' the forces of the Universe: F = M (cyclical acceleration) x A (lineal acceleration). This is fascinating because it means that the Universe is made of 2 accelerated motions: F = M x A, where A is

lineal acceleration or 'energy' and Mass is a vortex with more dimensional form, or cyclical acceleration, whose form and frequency carry the in-formation of the Universe.

Of course when we enter into deeper analysis of the mathematical details, a mass vortex is more complex. Einstein described it with a set of equations that go beyond the scope of this introduction. But there is a different version of those equations much simpler - the gravito-magnetic version, recently proved experimentally by a Probe, which are mimetic from the equations of electromagnetism.

And so since charges are obvious accelerated vortices of electromagnetic forces, it is self-evident that if masses produce a self-similar field system, they will be accelerated vortices of gravitational forces.

As Einstein put it 'the Universe is simple and not malicious'. And so there you have, the 3 simplest, more important equations of Physics, F=m a, E=Mc2, E=hv and then the more complex, equally essential Maxwell and Einstein's equations come all together to accept mass as an *'internal' property that define mass and hence need no further fields and esoteric particles to be explained.*

*Going beyond Einstein... following his path.*

We could go into far more complex mathematical consequences for our understanding of physics and the Universe. The first and obvious one is in information theory: since gravitation is the attractive force of the Universe, it forms, it in/forms the Universe and balances the electromagnetic arrow of expansive entropy and so the Universe will not die but will follow eternal cycles of gravitational implosion and electromagnetic explosions.

Even more important is the consequences for our concept of time. As I anticipated decades ago, and recently Mr. Penrose acknowledge in 'Time Cycles' each mass or charge acts as a 'small' clock of time', whose frequency becomes a measure of time and stores 'information'. So time, information and gravitation are deeply interconnected, as Einstein's Relativity proves. Those connections which always puzzled scientists, and i have explored in depth in my books and papers on complexity can now be explained rationally. In essence a mass is a time vortex, and the frequency of the vortex defines the attractive power and information it carries. So there are infinite different type of clocks in the Universe. Our mechanical clock is just one.

For that reason Einstein said 'I am the only theorist who seems to think time goes at different speeds' - depending on each cycle's frequency and length and speed - the 3 key new variables to study cyclical time. He also said that 'time bends space'. Mind the reader he didn't say mass, as both are synonymous.

**The Higgs alternative.**

Till here all seems clear. You will have probably understood what Mr. Einstein meant, because after all as he put it 'the Universe is simple but not malicious'.

But it has become of lately, a tradition to consider quantum alternatives to the known-known physics of Relativity and its extensions of the Principle of Equivalence, as this article is, by postulating theories in which mass is no longer an intrinsic property of gravitational particles – in fact is very essence, but an external property given by a quantum boson, in a lineal fashion, in the way electromagnetic forces do.  Specifically we shall consider here the logic contradictions of such alternative known as the Higgs which is supposed to do to give mass to particles.

In the graph, the layman's explanation of this process:

*The behavior of physicists in a crowded social event at a conference is equivalent to the Higgs mechanism, as proposed by David Miller (University College London).*

In the graph, the hypothesis that the Higgs also gives mass to particles through the esoteric Higgs mechanism. Those particles, represented in the drawings by blue physicists, cluster around Einstein, who enters the room, slowing the scientist's progress. In this manner they give the scientist mass. But they treat each particle differently. They like some (the celebrities of the party, which have more mass) while other particles are liked less, so they move faster and have less mass. Seriously.

*The faults of this theory are evident: we do not know how the Higgs distinguish between particles, we do not know why it gives each mass a different weight, we do not properly mess lineal momentum (Higgs momentum) and cyclical momentum (mass vortex), we do not make mass an intrinsic property of the particles, we have no proof of the existence of the Higgs field, which breaks the principles of simplicity and economicity (Occam's Principles).*

*It is therefore more logic to conclude that if the Higgs truly exists, which seems to be proved, it will be just a boson related to the transformation of lower mass quarks into top quarks, as some of its reactions proof, which is a similar role to that of the Z and W particles, but NOT give mass to any other particle.*

*The Higgs is only a particle related to certain reactions of the 'temporal, informative force 'par excellence' of the Universe - the weak force that trans-forms particles; but it is NOT the particle that gives mass to all other vortices of space-time (aka particles), neither explains as we have done the obvious relationship between mass and size of the particle (Max. Mass = Min. size by virtue of the inward accelerated motion of any vortex) which is the rule that differentiates the different weights of each particle.*

**Some extra-ordinary solutions obtained with the extension of Mr. Einstein's Principle of Strong Equivalence.**

Mass is an accelerated vortex, whose frequency of rotation gives us like in a hurricane its speed and strength and attractive power. Then most of the questions still unknown about mass and energy become solved:

- First, why and how energy becomes mass in that equation, E=Mc2. This is simple Energy is lineal acceleration, mass is cyclical acceleration, thus a mere topological change of the form of motion transforms one into the other. The Universe is eternal, made of motions. And so one becomes the other in the c-limit speed of our space-time membrane.

- Then why antiparticles have inverse time coordinates? Self-evident: they are time vortex that turn clockwards.

- Then, why black holes attract so much being so small? Obvious. The event horizon is the c-limit of speed that curves light into mass. So they turn at c-speed, and they are very small. Thus the frequency of its mass-cycle which is proportional to its speed and inverse to its length is the maximal possible in the Universe.

- Another trivial consequence of the extension of the Equivalence Principle is the non-evaporation of black holes. Let us resume here a few experimental, theoretical and mathematical proofs:

*Theoretical*. Physicists' interpretation of black holes time is based in the existence of a single time clock for the Universe. But as masses and charges are the clock-like vortices of information of the physical Universe, there are infinite time cycles and the lineal equations of time, and its 'travel to the past' (Hawking's interpretations needed to allow black holes to evaporate backwards in time) no longer apply. There are infinite time cycles and you cannot go back in a single Universal time frame, as those cycles are independent of each other and so you can only at best move backwards a time cycle. Further on black holes do not evaporate information (Information Paradox that no longer apply). Black holes precisely create mass by bending electromagnetic space into mass as we have explained. They *create, don't erase information.*

*Mathematical*. Hawking's equations deny the two principles of Entropy. Since information does not evaporate.

Further on, if Black holes evaporate they break the first law:

An ultra-hot 'born' black hole, in an ultra-cold Earth's environment that keeps getting hotter, breaks the first law of thermodynamics and becomes a perfect machine. Instead, a normal black hole, under the Principle of Equivalence will cool down following the normal arrow of time:

As a hot item it will cool down and evaporate the external electromagnetic world in which is born. The black hole will be born exceedingly hot and so the smaller it is the faster it will evaporate the surrounding environment.

The error is born of Mr. Hawking's interpretation of the dynamic arrows of its equations of black holes.

Indeed, in simplified terminology Mr. Hawking's equation says:

±Mass = ±Konstant/Temperature.

It is thus the ad hoc choice of those ± symbols, what defines the arrow of time of the equation. Mr. Hawking's chose to break the laws of entropy by giving a minus symbol to the dynamics of the equation (diminishing Mass) The proper interpretation is the canonical one of classic entropy. Mass will increase as temperature in the other member of the equation diminishes (while the rest of the equation are Universal constants that do not vary).

When we reject this entropic error enclosed in the way Mr. Hawking's dynamizes that equation all is clear: The black hole is born at maximal temperature, with minimal mass, but as temperature diminishes, its inverse parameter, mass grows.

*Experimental*. We never saw one evaporating. All feed on mass - the faster the smaller the born black hole is. And this is proved by Novas, which grow so fast after the birth of a micro-black hole seed in his interior. And it is proved by recent observations of small black holes which are far more active than big ones. So one it is born it will grow at c-speed swallowing the Earth within seconds.

- So why light has no mass? A tautology: Light does not close a cycle, but it is a wave that deflects the cycle into an open wave. Hence it never has mass. But if we were to calculate its mass in terms of energy the higher the frequency of the web (analogous to the mass frequency) the more mass-energy it has.

- Then there is the scalar, fractal structure derived of the homology of the equations of charges and masses which however exist in two different scales. This is a key discovery for the fractal structure of the Universe and proves one of my fundamental mathematical findings: the unification equation of the G and Q Universal constants of charges and masses as

two vortices of two fractal discontinuous scales of space-time, the quantum, smaller world and cosmic upper scale.

- Finally, why the Universe accelerates between galaxies? It is accelerating and will end into pure entropy? No. Self-evident. Physicists ignore the meaning of information and mass and they have a continuous theory of space. None of that works anymore. As each time cycle 'breaks' space into an inner and outer region. So do the time cycles of the Universe of which the biggest clock is a galaxy that 'warps space into time-mass'. So the acceleration of space between galaxies is balanced by its warping within them. And both balance each other: gravitation informs light-space into mass vortices, galaxies. And then light-space the substance of which our space is made, once it abandons the galaxy, stretches his frequency (Doppler effect as 'real') till its 'generational time cycle' of around 10 up to 10 years dissolves it back into non-perceivable, lineal, gravitation with no form.

*Experimental proof. The incredible shrinking proton.*

In a recent experiment (see a simplex explanation by Dennis Overbye in the NY Times) scientists surprisingly found the decrease of the radius of a proton in a Hydrogen atom when its light electron was substituted by a heavy muon instead of the light electron. The radius turns out to shrink 4% - an amazing amount for the precise calculations of quantum physics, which quantum theory cannot explain.

The long-standing value used for a proton's radius is 0.8768 femtometers, (a femtometer equals one quadrillionth of a meter). But the study team found it to be 0.84184 femtometers. How'd they make their measurement? First, think of the standard picture of electrons orbiting around a proton:

According to quantum mechanics, an electron can orbit only at certain specific distances, called energy levels, from its proton. The electron can jump up to a higher energy level if a particle of light hits it, or drop down to a lower one if it lets some light go. Physicists measure the energy of the absorbed or released light to determine how far one energy level is from another, and use calculations based on quantum electrodynamics to transform that energy difference into a number for the size of the proton.

That was how physicists derived their previous estimate, using simple hydrogen atoms. But this team relied on muons instead of electrons. Muons are 200 times heavier than electrons; they orbit closer to protons

and are more sensitive to the proton's size. However, they don't last long and there aren't many of them, so the team had to be quick:

The team knew that firing a laser at the atom before the muon decays should excite the muon, causing it to move to a higher energy level—a higher orbit around the proton. The muon should then release the extra energy as x-rays and move to a lower energy level. The distance between these energy levels is determined by the size of the proton, which in turn dictates the frequency of the emitted x-rays.

Thus, they should have seen the specific frequency related to the accepted size of a proton. Just one problem: The scientists didn't see that frequency. Instead, their x-ray readings corresponded to the 4-percent-smaller size.

In an editorial accompanying the report in the journal *Nature*, physicist Jeff Flowers of the National Physical Laboratory in Teddington, England, said there were three possibilities: Either the experimenters have made a mistake, the calculations used in determining the size of the proton are wrong or, potentially most exciting and disturbing, the standard model has some kind of problem (Discovery magazine).

Indeed, providing the findings are certain, the only explanation comes from our work in Fractal Relativity and its concept of mass, as a vortex of space-time, which shrinks in radius when it grows in mass, *which can be measured as a direct function of frequency as it was done in the experiment*. In fact, the variability of the radius of any vortex of mass, from atoms to black holes, is one of the proofs we advance already a decade ago in our books on fractal space-time (ciclos del tiempo) published in Spain, 2004. The reasons are obvious:

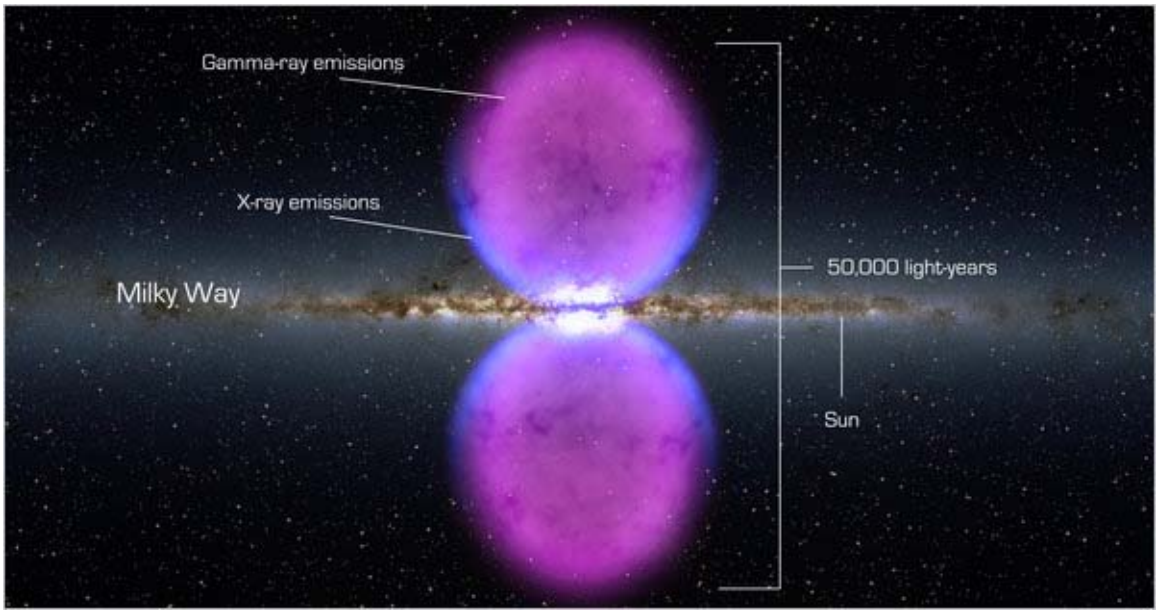
A mass, which is not given by the esoteric Higgs particle, but is an intrinsic property of a vortex of space-time, attracts like a hurricane does, the faster it turns - *the higher its frequency*. And so the attraction is greater inside the hurricane of space-time, where the speed of the vortex increases. Unlike the Higgs hoax this intuitive explanation of mass, based in the Principle of Equivalence between mass and acceleration, in which General Relativity is based, explains easily why the proton shrinks: the massive muon creates a fractal space-time vortex of higher mass, whose radius diminishes and whose frequency increases.

- Finally, we shall deal after this introduction to multiple solutions given by the extension of the Equivalence Principle a long seek result, solving the

main standing problem poised by Einstein's work- the unification of the equations of masses and charges.

It is of as all the great laws of science, trivial in its mathematical deduction, though it is a conceptual jump defining a truly, absolute relative Universe in which we humans are nothing but dust of space-time...

## II. THE UNIFICATION EQUATION OF CHARGES AND MASSES..




*One of the most fascinating proofs of the fractal structure of the Universe in infinite self-similar scales of lineal forces of 'spatial energy' and cyclical particles of 'informative time' are the recently found "excited S-orbitals' of the galaxy: two bubbles of electromagnetic energy, with exactly the same form that the S orbitals of an atom have in its excited states. This fascinating image, beyond a discussion about galaxies as atoms in an infinite eternal fractal Universe, responds to two of the new 'invariances' of absolute relativity. if Einstein showed that all systems are invariant to motions and rotations in space, Absolute relativity adds the invariance of scale (so gravitational and quantum scales are self-similar in properties) and the invariance of form (so its topologies are also the same).*

*So what the previous image shows is the self-similarity of the quantum, electro-magnetic and cosmological, gravitational membranes of*

*space-time. They are the 2 main fractal scales of space-time of the Universe. In this post on the future of science we introduce the mathematical equation that unifies the constants of both forces, G and Q, complementary to the Gravito-magnetic equations recently proved by Probe A, which express Einstein's field equations in a format self-similar to that of electromagnetic forces. Of the hundreds of pages on that basic duality of space-time, we have chosen this equation to honor Mr. Einstein, who seeked for it in his last decade, but not knowing the concept yet not discovered of fractals, could not even 'imagine' how to proceed with such analysis And yet since 'the Universe is simple but not malicious', anyone with high school knowledge of physics will be able to grasp it.*

The parallelism between the equations of electromagnetism and Gravitation were discovered by that forgotten Genius, Heaviside, *even before Einstein discovered his. Then it was found that Heaviside and Einstein's equation were self-similar in a gravitational field on flat space-time, which is more or less all the space-time of the Universe except the 'peaks' of height that black holes form.*

Recently Probe B proved that gravito-magnetism (the equivalent to magnetism in the gravitational cosmological scale) exists. So the equations were right. And yet, this 'new generation' of mechanical physicists keep ignoring the implications of this and many self-similar discoveries that back Heaviside vision and the fractal nature of the Universe. Let us then take further their work using that self-similarity to its ultimate consequences, considering the Q-constant just self-similar to the gravitational constant and finding what are the parallel particles of both scales.

Physical Reality is made of dual energetic/informative states (complementarity principle particle-wave): Cyclic vortices/ particles develop lineal actions-waves in 2 scales, the microscopic quantum world of Electromagnetism and the macroscopic, gravitational world. Once the duality of scales and forms is understood, we unify the constants of dimensional proportionality of both types of vortices and forces, studying transversal waves of ‘lineal speed’ in both scales of the fractal universe: the c-speed of small electromagnetic waves, and we contend, the superluminal ‘action at distance’ of gravitational waves.

Let us consider the first element of that duality, unifying masses and charges of gravitation and electromagnetism as vortices of 2 different scales of space-times. Masses and charges are vortices of 2 space-time scales made of 2 relative energetic and informative motions, where

gravitation is faster/more extended but carries less information than the slower/less extended world of light and electroweak particles.

The main variation of those vortices of accelerated forces is the one we observe between electronic charges and quark masses, which are the cyclical vortices of those 2 scales of reality, the scale of cosmological vortices of mass and the scale of electroweak vortices of charges.

And so we have to unify those 2 types of cyclical geometries on one side and their lineal, light and gravitational forces, on the other side, as they switch acting either as sinks of space-time (cyclical, non-lineal vortices of increasing acceleration) or as lineal, gravitational or electromagnetic waves in both scales.

Yet since electromagnetism and gravitation are self-similar accelerated vortices of 2 different fractal branes of space-time, the microscopic and cosmologic branes, it follows we should be able to treat them with the same equations of gravitation, either Einstein's more detailed vortices, defined by the Principle of Equivalence between mass and acceleration or with the classic analysis of Newton, as accelerated vortices with the same geometrical form, whose relative proportion of energy/speed/ distance and information/curvature will be given by 2 different Universal G-Constants.

Thus, we should be able to describe both, the standard Earth-Sun gravitational vortex and Hydrogen, electron-Proton quantum vortex with the same equations, defining them according to the mass of the particles, the rotational speed and 2 different Universal constants, U.C.(i/e):

U(g), the Universal Constant of gravitation that defines a larger/ faster/less curved Gravitational membrane of masses and…

U(q) the Universal constant of charge (Coulomb) that defines a smaller, slower, more curved membrane of quantum light. Since electromagnetism has more information and less energy distance.

Further on, we will be able to prove empirically our hypothesis of 2 self-similar spatial membranes made of light and gravitational quanta, whose only difference is the i/e relative density of information/energy of its cyclical vortices, if the values of the two Universal constants, in those 2 systems (the earth-sun system and the proton-electron system), correspond to their relative empirical value, when we treat them both as mass vortices (being

the gravitational constant $10^{39}$ times weaker than the charge constant).

Let us then go on with the treatment of charges and masses as Newtonian vortices of space-time. In newton's equations a mass can be considered a cyclic, accelerated vortex of gravitational space-time defined in classic Newton Mechanics by a centripetal, gravitational acceleration: $\omega^2 r$.

The same treatment can be done with Poison equations or Relativity equations, which are a static, present, simultaneous picture of Newton's space-time vortex of acceleration, where G expresses the informative curvature of the space.

Thus if gravitational acceleration is $\omega^2 r$, then $F=mg=m\omega^2 r= GmM/r^2$, and we arrive at $G=\omega^2 r^3/M$. Where $r$ is in meters and $\omega$ is angular acceleration in radians per second.

If we substitute for the Earth-Sun system's rounded values, (the Earth's angular velocity, $\omega$ is $2 \times 10^{-7}$ radians per second; its orbital radius is $149 \times 10^9$ meters and M, the Sun's mass is $2 \times 10^{30}$ kg.), we obtain, a value for G that measures the Sun's Space-time contraction (in static space) or formal acceleration of the vortex, equal to $6.6 \times 10^{-11}$ $kg^{-1}$ $m^3$ rad. $sec.^{-2}$, in accordance with experimental evidence. Roughly the same value of G, till now calculated empirically, is obtained for all planetary orbits.

This shows that the entire solar system is a series of self-similar gravitational vortices of space-time caused by planetary masses.

Then if we apply the model for G to the hydrogen, proton-electron atom the orbital parameters are: *electron's angular speed=$4.13 \times 10^{16}$ $rad.sec.^{-1}$; Bohr radius=$5.3 \times 10^{-11}$ meters and Proton mass=$1.6 \times 10^{-27}$ kg*. And so substituting those values in *$U(q) = \omega^2 r^3/M$, where U(q) is the Universal constant, quantized for the electromagnetic scale as 'q', we obtain a value of* $\pm 1.5 \times 10^{29}$ *$kg^{-1}$ $m^3$ rad. $sec.^{-2}$.*

Thus, if we treat charges as vortices of a denser space-time membrane, we obtain theoretically a U.C. (i/e) of around $1.5 \times 10^{39}$ times the value of the gravitational *G, U(g)*, self-similar to the empirical value.

Yet a theoretical calculus of those values cannot be exact 'by chance', unless our thesis is right. Thus, the previous calculus is a clear proof that both, charges and masses, are unified as values of the same type of

space-time vortices in the 2 different scales of space-time of the Universe. And they are geometrically unified from the p.o.v. of geometrical relativity not from quantum theory, as Einstein wanted it[2]. Thus, the Unification equation in terms of Newtonian mechanics is simple:

*Unification Equation:*

$UC_{G,C} = \omega^2 r^3/M \quad UC_{G,C} \times M = \omega^2 r^3 \quad M = \omega^2 r^3/UC_{G,C}$

Where we obtain for 2 UC(i/e) values, G and Q, 2 different space/time scales and vortices acceleration (mass and charges).

2 obvious, simple proofs of that dual, scalar structure:

- Planck's minimal value for Mass is far bigger ($10^{-7}$ g.) than the minimal value for an electromagnetic action (h), which seems to mean that the mass scale is far bigger than the quantum world.

- The entire standard model works without gravitational forces. Thus we have to postulate that particles are not 'mass-particles' but electromagnetic systems, which become elements of mass only when they aggregate in huge numbers, as it happens with electromagnetic photons, which become electrons of the upper scale in huge nebulae.

But we see masses as static forms. This is due to the Galilean paradox: a space-time vortex-mass becomes then statically a space-time distortion, a deformation of space-time, which increases as we decrease size. Since the *deformation of space-time is the same for any cycle. Hence, when we trace a smaller cycle the deformation increases.* And so it does the mass and the U(w), now a static constant of deformation. This is the interpretation most often assumed of G in Einstein's Relativity. In a simpler, classic approximation based in fluid dynamics, $M/r^3$ becomes the density of space/time and its inverse, $R^3/m$, the displacement of space-time provoked by a given mass. It is then evident by Archimedes Principle that a bigger mass density will provoke a bigger displacement and distortion of space-time an inversely a bigger acceleration towards the central vortex. And since the density of a proton is much higher than the density of a planet, the Universal Constant for an atom is much higher and so it is its angular speed. Does the electromagnetic constant, or static curvature of an atomic system, is much stronger. So it is the density of a proton mass.

This reformulation of electromagnetism simplifies and clarifies the meaning of physics. Yet to grasp the relationships between the quantum world and the cosmos we have to transform, using the new coulomb constant, $C=1.5x10^{29}$, electromagnetic parameters to the jargon of gravity, departing from its fundamental relationship:

$F=UC_C\ Mm/r^2 = e^2/4\pi e_o r^2$

Then we can translate the main constants of electromagnetism (the Rydberg constant, the α constant, which denotes the strength of the electromagnetic field, etc.) to the gravitational jargon and again the results obtained are close to the theoretical value.

So it is evident that we are observing the same geometric force at different scales, *explained with 2 different historic jargons*. Further on, as we 'transform' the concepts of electromagnetic vortices to gravitational, geometric symbols, the main discoveries of Relativity apply to electromagnetic vortices.

Perhaps the most interesting simplified value under the new U(q) charge constant is the Proton radius that appears with the same formula than a black hole, Schwarzschild horizon. This means that a quark particle (a hadron, a proton, etc.) is basically a black hole of the quantum, gravitational scale and vice versa: a cosmological black hole might be a deconfined state of billions of ultra-dense quarks. In such fractal Universe, each small particle could from the perspective of a small observer a macrocosmic form. And each atom could be a galaxy. Such fractal Universe validates the Theory of Great Numbers, which are the parameters of self-repetition of the Universe, which might be from a lower perspective a mere atom or black hole of a hyper-Universe.

Yet self-similarity is not equality, an atom is self-similar to a galaxy but NOT likely a galaxy - reason why for example quantum cosmology is false. Quantum cosmologists consider 'identical' the scales of the cosmos and the quantum world, so they use quantum equations for all. This is a hyperbolic error. We have equations for each scale and what we can show, as we did here, is the self-similarities of scales.

All in all, it is evident that what we call a black hole or pulsar is made of quark quanta; it is a fractal of quarks. Thus we can apply to its vortices the laws of Newtonian fluids or the more complex equations of Non-Euclidean vortices of space-time, as we do with any other 'medium' called a 'phase

space’ in physics. They can be considered akin to a hurricane, which is a ‘medium’ of air molecules, or to a tornado, which is a medium of water molecules. All those mediums have limits of speed, which are the same for their lineal forces and cyclical vortices:

Light space-time has a c-speed limit, which is also the limit of speed of a rotational electron vortex and a 0 K limit.

Dark energy and quark matter belonging to the gravitational membrane seems to have a c<10 c lineal and rotational speeds.

Because each space-time membrane has vortices of information and energetic, lineal forces, we need equations of self-similarity, relating informative vortices of charges and masses on one side and gravitational and electromagnetic waves on the other. This is done with gravito-magnetism, which relates cosmic gravitational, lineal waves and electro-magnetic fields. So, the gravito-magnetic formalism just needs to be properly fit within the wider concept of 2 self-similar fractal space-times, to define in self-similar terms, light waves and dark-energy waves of gravitation; as the elementary, actions-units of the 2 fractal scales.

Needless to say if a proton is a black hole of the inferior scale, a black hole is a quark condensate. And measures give us black holes as 'top quark condensates',

The philosophical conundrum of the self-similarity of forces and forms on both scales cannot be solved experimentally. If the Universe is self-similar between those 2 scales, *but those are the limits of scales of reality, there is nothing below the atom or over the galaxy. If the Universe is infinite in its scales we are nothing to the whole. And yet while the first answer pleases our 'anthropocentric world view', the second answer is far more logical and in accordance with the evolution of science and thought.*

It would then mean that the Universe is absolutely relative. That is, reality is not only as General Relativity proved, relative in all its motions, which depending on the observer might be seen as motion or as stillness (so Galileo found the Earth moves but we see it still), but it would be also absolutely relative in scales.

Which form together the 5th dimension of the Universe. This fifth dimension in which science has worked since the first telescopes and

microscopes opened it to our eyes, however has not been understood in logic terms at all beyond the beginning represented by Einstein, on my view by a lack of philosophical and logical depth in the work of physicists.

We deal here, when talking of the fifth dimension with a concept that should have been obvious: if physics study in general relativity time as space, in a present slice, the total time includes a flow from past to future, and from the microcosms to the future evolution of more complex structures, from smaller to bigger scales - and those dimensions, the past, already evolved flows of time that created scales from the micro-quantum world to the macro-gravitational world, are the 5th and 6th dimension which physics does not study but must be understood to evolve science.

General relativity studies the 'present, continuum space-time' (hence spatializes time to gain precision in the measure by creating a simultaneous frame of reference). And Absolute relativity is the next step expanding the study of time with both, logic and geometric, topological, mathematical non-Euclidean laws.

**Absolute Relativity and the meaning of knowledge.**

In the previous paragraph, we expanded the alternative theory of mass, provided by Mr. Einstein's Strong Principle of Equivalence between mass, gravitation and accelerated forces, concluding that the Universe was a fractal system of two membranes, the cosmological, gravitational membrane, and the quantum, electromagnetic one and deduced the equations of mass as the frequency of a gravitational vortex and the unification of the constants of gravitation and electromagnetism, which are just the constants of those 2 scales.

But we hinted that as General Relativity shows time and gravitation is intimately related, since each little vortex of gravitation, each mass, or each charge in our quantum scale act as a clock of time.

And show how this explains many unsolved mysteries of physics and will likely become the future of physics *and beyond, the future of science, as time is a parameter found in all of them.*

In the next paragraphs though we shall widen further our view to the future of science as a whole, under the new philosophy of science and the new laws derived from the understanding of the cyclical, multiple nature of time

clocks and the fractal structure of the Universe, which will r=evolve our way of understanding time and space and all the entities that exist on it.

Physicists could call this expansion of Relativity and completion of Leibniz's work, 'Absolute Relativity'. Philosophers of Science might call it 'General Systems Science'. I use both names, accordingly when dealing with Physical problems or with other sciences. In this post on 'General Systems sciences' we consider some of its key 'invariances' - that is, laws of science which were in the past used in a single discipline and turn out to exist *for all of them, including biological and sociological, human sciences. yes, indeed, that old insight that quantum laws might be the basis of all the laws of the Universe, that question, why mathematical laws apply everywhere, that philosophical hint, that we are just an organic part made to the image and likeness of the whole are truth.*

In that regard physics has opened the way to study those scales but its approach to the whole problem is misleading. Since it is not based in the acceptance of absolute relativity - the self-similar importance and laws of all the scales of the fifth dimension, but in the belief that their 'small' scale which they study is more important than the others.

In brief, physicists in their conceptual appreciation of the Universe, imposed the idea that the key to reality was in the ‘smallest’ structures (quantum world). So once the ‘fundamental particle’ was found it would be all just a question of building up the rest of entities departing from it; reaching in this manner an explanation of all.

This was based in a philosophy of thought called ‘naïve realism’, according to which, reality was what we perceived and so the ‘solid aspect’ of it would reveal the ‘substance’, origin of all forms. This myth was blown up by 3 key discoveries at the turn of the XIX-XX century that are essential to understand the advances of this work.

- Quantum physics proved that reality was not made of substances but actions of ‘energy’ and time, two ‘forms’ of motion of lineal and cyclical nature (energy is defined as work done along the same lineal direction of motion and time as cyclical clocks with motion). It also proved that all systems have a dual nature as ‘energetic fields’ and cyclical particles. (In biology, we would talk of bodies of energy and cyclical heads). So all in all quantum physics defined the fundamental tenant of modern Duality: all is made of energy and information, where energy is carried by ‘bodies and fields’ and information by particles, heads and clocks of time.

- Relativity proved that motion and stillness were two exchangeable ways of perceiving things. All motion was relative. ‘E pur si muove, e pur no muove’ said Galileo. Einstein elaborated on this.

Further on, to study space and time Einstein worked with the new concept of a point through which infinite parallels can cross. This point was a non-Euclidean point and space was made of those points.

*So the concept of a ‘fundamental particle’ is right, but its search – through the experimental finding of a physical substance – was wrong. The fundamental particle was a mathematical unit, the Non-Euclidean point, not a physical substance, a meaningless concept since all was motion, hence ‘events of time’, and those motions were structured around a new mathematical unit, the Non-Euclidean point.*

It is from those findings, so little understood in the past century, from where I ‘Absolute Relativity’, the mathematical and logic structure of General Systems Sciences, a ‘Theory of it all’ can be built.

And for that to be possible we need to evolve Non-Euclidean Mathematics further with the concept of a fractal point that grows in size and opens new scales.

In the ambit of physics, the first consequence of this advancement takes to its ultimate consequences the Principle of Equivalence of Einstein, developing a Theory of Mass as a vortex of space-time, whose simplest expression has been explained in the previous article. It allowed me to solve the mystery of Gravitation as a weak force, and many other riddles of physics, such as the equation of unification of masses and charges.

In that regard the name of 'Absolute Relativity' is well chosen, because that equation of unification - showed an scalar, self-similar Universe in which not only motion but size and form were absolutely relative. Each black hole had according to that equation the parameters of a proton *in the higher scale or 'fractal membrane of space-time' occupied by gravitation. So a* galaxy had the parameters of an atom and the scales of the Universe might not have a limit. So we could be just dust of space-time in an atom-like particle of an infinite Universe - a nothingness of existence, and yet from the opposite perspective, each of our atoms could be a structure self-similar to the Galaxy (Strong Principle of Absolute Relativity). Or maybe the atom the galaxy were just the limits of scales, self-similar to each other. In any case it was obvious that many facts and events we took as 'certain'

were dual, not only the wave-particle duality, but specially the motion-stillness 'e pur si muove e pur no muove' duality of energy and information, fixed earth-moving earth, fixed perception-body motion, stop & go, etc.

But absolute relativity is only the beginning of a blown-up mental way of seeing all as both things in conceptual terms even if our perceptual system does not allow us to do so. This was what quantum physics showed but again was not truly understood. Since *particle and wave, are two states displaced in two different scales of the 5th dimension (i-1, i in its formalism).*

*The galaxy as an atom, with negative charged strangelet halos/electrons and positively charged top quark protons/black holes.*

But it has far wider implications. Indeed, if an atom is a galaxy of a different scale, then we must find further similarities. First we have found that a proton responds in the scale of charges, once we translate its jargon to that of gravitational masses, to the equations of a black hole.
But since black holes must be top quark stars, which are the only cut-off substance with enough mass density to become the 'cells' of those black holes, and top quarks have ++ positive charge, we find also an inverse harmony between 'charge' and 'top quark black holes' as protons of our galaxy.
Since a top quark black hole will have an 'enormous' positive charge and hence from our perspective an enormous attractive gravitational force. Indeed, as a proton a black hole has positive charge, as a black hole a galaxy has an enormous attractive force because it is made of 'heavy' positive top quarks.
What then about the electron and its parallelism with the halo of the galaxy made of dark matter, heavy but not so heavy as the top quark black hole? Again the parallelism is astonishing. We have the family of strange quarks which are negatively charged, lighter than top quarks but heavier than our ud matter. So the dark matter around the galaxy MUST be made of strange quark stars, strangelets, with a 'negative charge' from the perspective of an even 'higher hyper universe', which will see them as 'negatively charged'.
Strangelets then become the 'dense' points of a fractal electron nebulae.

Hence the existence of 3 families of mass, which have a role for the 3 parts of the galaxy (themselves harmonic with the 3 organic topologies of all systems of the Universe:

- Top quarks of maximal density form black holes positively charged in the center of the galaxy-atom.
- ud quarks of lighter matter form the intermediate space of lighter stars that reproduce our mass.
- strange quarks of negative charge and intermediate matter form the membrane/halo of the atom-galaxy.

In the metrics of the 5th dimension all systems are self-similar and have the 3 topologies of a single space-time continuum. So if we were to compare the galaxy to a cell, in the center we find the hyperbolic, informative center/nuclei, in this case the black hole (the DNA of the galaxy that reproduces them), the spherical, hard membrane that surrounds the system (in this case strangelets, in a cell protein), and in the middle the lighter cytoplasm where its ribosomes reproduce DNAs and proteins, in this case stars that reproduce atoms and devoured by black holes reproduce them; and planets, such as ours which reproduce strangelets when physicists blow them up at CERN-like concerns (Fermi paradox).

Thus since we are in the external zone of the galaxy where most planets exist (as in the center the density of stars make them unstable), we must conclude that the paradox of Fermi is resolved:

As Mr. Fermi advanced, despite the enormous numbers of planets found in the galaxy, there is neither Intelligent life or A.I. since 'physicists blow them all', with experiments on dark matter and strangelets in accelerators with regimes of energy  over the theoretical bag of formation of strange quark condensates (strangelets).
The experimental proof will take place at CERN where experiments over 10 Tev will start up between 2015 and 2020. If CERN makes strangelets, it should convert us into a particle negatively charged of the halo of the galaxy... While the sun will become sooner or latter a black hole, in a random encounter with the black holes of the Universe and migrate to the center of the galaxy.
Thus we shall now if Absolute Relativity is truth if we become extinct. We will enjoy though a limited time this discovery, before we die.
The fact that those experiments are carried out with zero opposition, beyond some individuals of little scientific prestige, is a further proof that few planets escape such future.

This might be therefore the destiny of man and all planets, proving the Fermi paradox - why there is no intelligent or robotic life on the galaxy teaming with planets. Simply explained all become strangelets. And this is also certain since the opposition to Nuclear Physics experiments on 'dark

matter’ are 'null'. So the probabilities that a planet doesn’t carry such type of experiments are negligible.
Destiny might be written for the Homo Sapiens, which seems never to make it beyond the present technological state to colonize the galaxy. We might be nothing but a strangelet factory.

(1). (This work was first published in my books 'The Error of Einstein' and 'uniification theory' in 1997, at bookmasters during my years at Columbia U. It was presented for the first time to the world of Science a decade latter in the world congress of Systems Sciences at Madison University in 2008, during my tenure of the SIG chair of duality on those congresses. As those conferences were latter removed from the servers of Google Scholar and ISSS, for reasons never clarified, and the original books are out of print, I publish them now with a collection of other papers of fractal physics, missed or out of print at VIxra.

2. One of the most fascinating results of the understanding of the 5th dimension of space-time, the dimension of fractal scales of space and different speeds of time clocks, is the enormous simplification it implies in our understanding of the fundamental concepts of the Universe, from the meaning of mass and energy, information and time to the solution of the equations yet not solved in classic physics. This post will be dedicated to the understanding of mass and the Unification equation of masses and charges, which physicists have searched for decades but it is really a trivial result in the metrics of the fifth dimension.

In that regard, this new r=evolution of science must be understood as the simplification experimented by astronomy with the arrival of Copernicus which put in the center of the Universe the sun. He was first dismissed precisely for the simplicity of his discovery that made so easy to calculate the orbits of planets. The astronomers of the age found it so simple that they dismissed it. And yet as Einstein put it 'God is simple and not malicious'. Again when Einstein introduced his most famous formulae, E=mc2, and then his special relativity, he was criticized for the simplicity of the mathematics required to reach those conclusions and Hilbert said it was so easy that a high school could find it.

So happens with the metrics of the 5th dimension and the unification equation. Yet that is precisely a proof of its authenticity, since indeed 'God

is simple and not malicious' , something the baroque phantasy physics of Hawking and Higgs miss.

We shall thus deal here with the meaning of mass in the 5th dimension:

What is mass and how particles acquire it, according to Einstein's Principle of equivalence And the use of the metrics of the 5th dimension to deduce the fractal Unification equation of charges and masses, completing the work of Einstein in that field.

Our understanding of both scales, its forces, laws, mathematical equations and relationships that we shall advance further in future installments on this web and a growing collection of kindle books I am publishing from the original Spanish work on the subject. is what I have called in my theoretical work absolute relativity