Journal of Theoretics

THE BLACK HOLE ELECTRON

Author: D. Di Mario

d.dimario@infinito.it

Abstract: The theory presented in this article introduces new unknown relationships that may shed new light on the nature of matter. This theory allows the calculation of the gravitational constant (G) with a precision comparable to the other atomic constants, gives a direct relation between mass and charge of the electron without the need of the ubiquitous "classical electron radius" and generates a second fine structure constant while also offering the disconcerting possibility of an anti-gravitational force.

Keywords: black hole, electron, Planck charge, gravity, quantum physics.

Table of Contents

Foreword

Planck's black hole

The Planck charge

The spinning black hole

The quantum connection

The electron mass

The mystery of permittivity

The swirling electron

The bare particle

Quarks and other particles

The proton mass

The gravitomagnetic effect

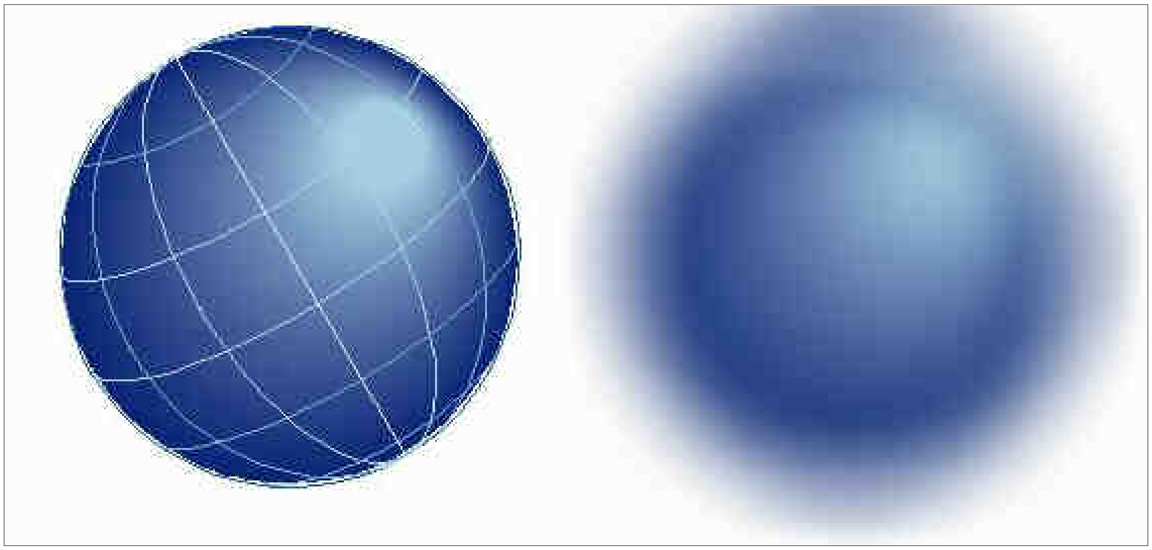
Closing on antigravity

Measuring antigravity

An accurate constant of gravity

Conclusions

FOREWORD



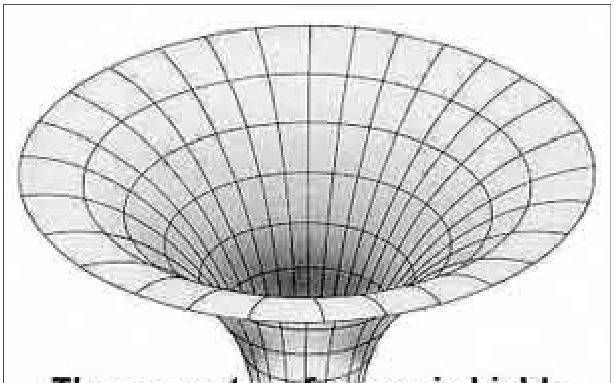
The electron, whether you like it as a well defined shape or as a (more likely) hazy blob of wavelike matter, has not surrendered all of its secrets. The quark structure is a comprehensive description of the possible excited states of matter but has added little to the understanding of the intimate nature of the electron. What we need is a leap forward enabling us to glimpse at the core of this particle and find a viable relationship between what is supposed to take place inside and what is measured outside. This is not as easy as it sounds because the hypothesis put forward here is that the electron itself is a miniature black hole analog. Besides, it would be highly desirable to define the black hole with the Planck time and mass only and have all the electron properties of charge, mass, etc, without introducing any additional parameters. In practice we should be able to define the electron using only the constant of gravitation, Planck's constant, and the speed of light.

PLANCK'S BLACK HOLE

It is not difficult to devise a black hole using some basic constants. The resulting object is rather meaningless until a new interpretation is applied on the nature of the electric force and look at it as a gravitational force changing with time, Planck's time, providing the frame of reference is the black hole itself. A spinning black hole of this kind would originate the electron mass and charge, the fine structure constant, and eventually provide a link between electricity and gravity. In order to create our model we first define Planck's time t_0 as follows:

$$t_0 = (\pi h G / c)^{1/2} / c^2 = 2.395 \times 10^{-43} \text{ sec}$$

where c = speed of light, h = Planck's constant and G = constant of gravitation. The numerical values used are the ones currently available and, apart for a $2^{1/2}\pi$ factor, it is the same as the Planck's time normally found in the literature. On the other hand, we do not know the intimate structure of a black hole and its geometry is certainly different from ours and the applicable time t_0 is not necessarily the one we normally calculate which is, after all, a purely theoretical value. The Planck mass m_0 related to time t_0 is defined as $h / t_0 c^2 = 3.078 \times 10^{-8}$ Kg. This particle with mass m_0 is considered as our ideal black hole. A black hole is not an ordinary body and the Planck's black hole


The geometry of space is highly deformed in the presence of a black hole

defined above is all the more weird. Not only it is necessary to deal with the distortion of the space-time continuum as in every black hole but, because of the short time involved, it is not even sure it really exists. A possible way out is to measure or predict some macroscopic effect, if any. One such effect could be the ratio F_g / F_e of the gravitational to the electric force between two electrons. This ratio is numerically very close, around 0.2%, to the Planck time t_0 given earlier. The hypothesis put forward is that the small numerical difference is due to the rotation of the black hole (with respect to a stationary black hole that would show no difference) and the different dimension between the above dimensionless ratio and t_0 depends on the fact that we will never be able to *physically* measure t_0 because the latter is the ultimate quantumization of time. We will still have the time dimension in our equations but we will not be able to experience the temporal dimension associated to t_0. The above considerations constitute the very essence of the black hole electron.

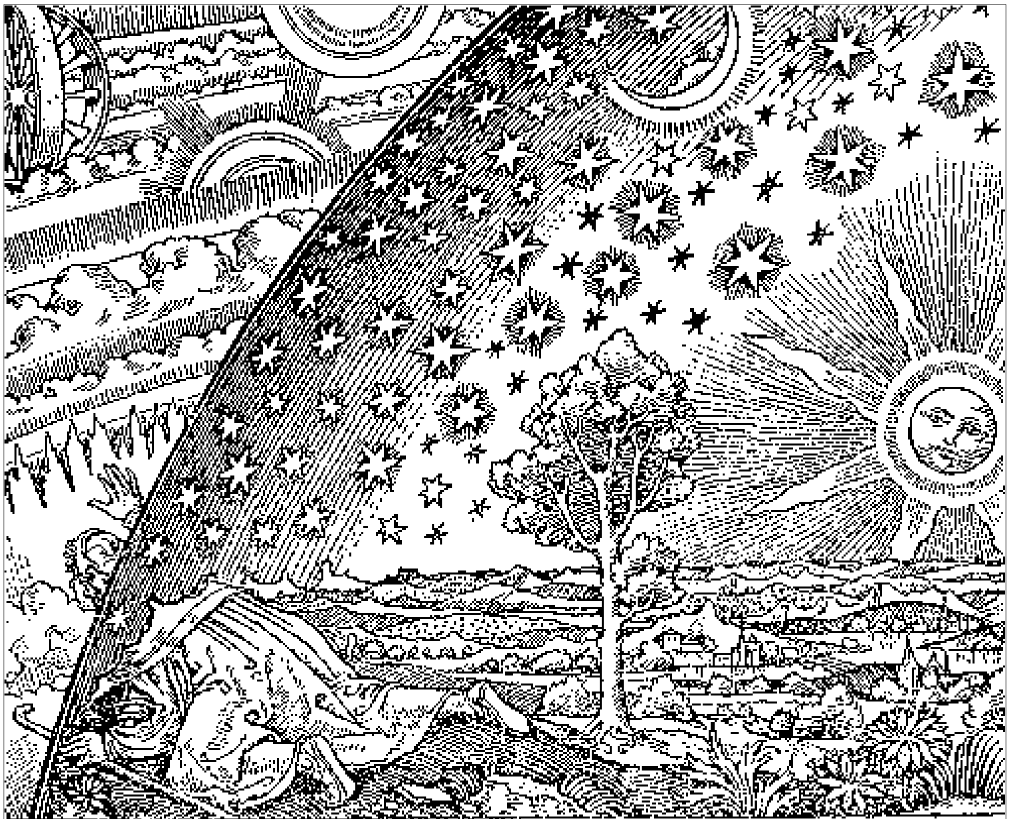
THE PLANCK CHARGE

Although time t_0 and the small size of this black hole are beyond our capacity of detection, we would expect to find a mass m_0 weighing around 30 micrograms. So far such a particle has never been found, but are we looking in the right direction?

Let us assume that the manifestation of mass m_0, to an outside observer, is not gravitational as expected but of an electric nature. As a consequence we should look for a charge Q_0 with an electric force equal to the gravitational force of mass m_0:

$$G\, m_0^2 = Q_0^2 / 4\, \pi\, \varepsilon_1$$

this is the equation we would expect at the Planck scale equating the gravitational and the electric force and could very well represent the quantumization of both charge and mass of our black hole. Outside the black hole we would have quite a different picture, derived from the above, where we would experience a different mass and charge, the electron in fact. The polarity of the charge, positive or negative, could be perhaps related to the creation or annihilation of the gravitational force within time t_0. This process would originate a variable gravitational force but we would be unable to detect such a variation and the only thing left would be a steady field and a sign indicating the direction of the variation. The particle would look like frozen in the moment of its creation. In practice, we have that no phenomena dependent on time t_0 could be correctly detected and there might be a dimensional difference between what the equations suggest and what we measure.



The frame of reference is of fundamental importance in Electrogravity. A time dimension appears if we would be part of the black hole. Out of the black hole the number representing the time becomes dimensionless and the same parameter could appear with another dimension.

The apparent dimensional difference between what we see in the equation and what we actually experience is the key for the correct interpretation of permittivity ε_1 (more on this later):

$$\varepsilon_1 = (t_0 / 4 \pi^2)^{1/4} = 8.825\text{x}10^{-12} \text{ sec}^{1/4}$$

From our point of view we would *physically* experience ε_1 as a dimensionless number because we are unable to measure time t_0. Once ε_1 is known, it becomes easy to get the value of charge Q_0:

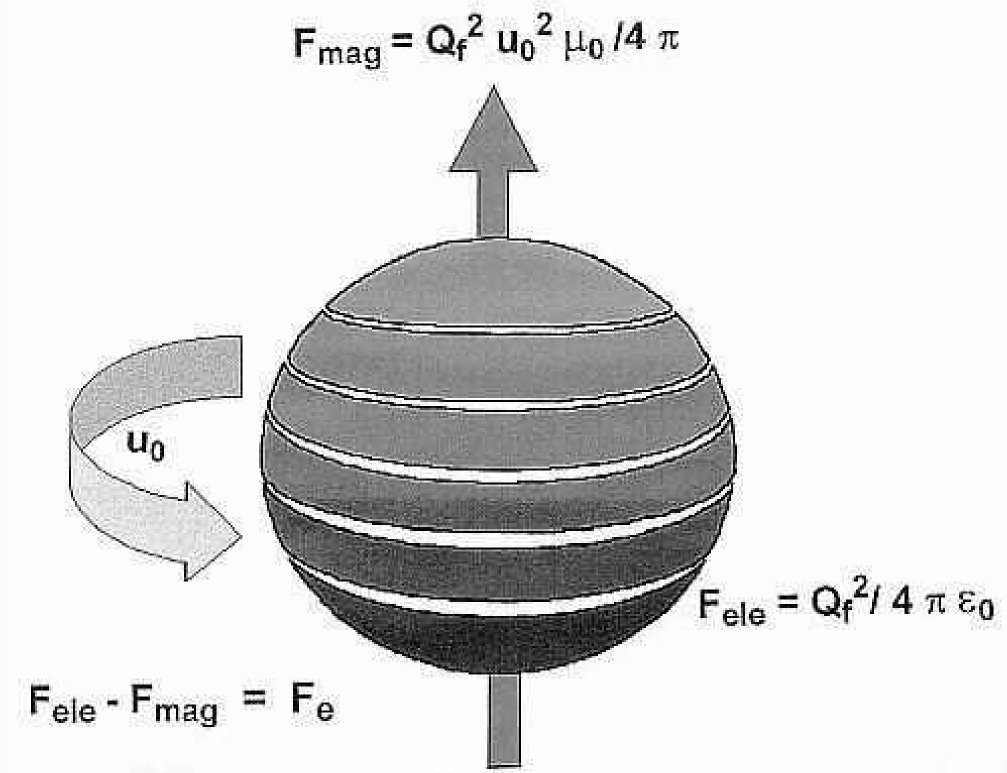
$$Q_0 = m_0(4\pi\varepsilon_1 G)^{1/2} =$$

$$2.648\text{x}10^{-18} m(\text{Kg sec}^{1/4} \text{ m})^{1/2} /\text{sec}$$

An observer far away from the black hole would see charge Q_0 with the basic dimensions of time, length and mass similar to the cgs system, but with numbers expected from the SI system. The introduction of the dimension of Coulomb would "mask" the true nature of the charge.

It would be nice if Q_0 and ε_1 would coincide with the known values of the electron charge and permittivity. This is not quite so: although ε_1 is only 0.3% different, we find Q_0 to be about 17 times larger than the electron charge. This is because no rotation was taken in account. A very fast rotation should be considered instead, and, in the case of a black hole, there would be only a small kernel, probably surrounded by an intense energy field.

THE SPINNING BLACK HOLE



There would be an increase of mass for a black hole spinning at relativistic speed u_0. Also the charge will show a larger value Q_f. This charge will be responsible for the electric force F_{ele} of the black hole and also for its magnetic force F_{mag}. These two forces are in opposition and we would be able only to measure the resulting force F_e corresponding to the electron charge.

The fast rotation at speed u_0 of our black hole seems to be related to the fine structure constant α in the following way:

$$\alpha / 2 = 1 - u_0^2 / c^2$$

This is a plain hypothesis but similar relationships have been put forward by a number of researchers investigating the intimate nature of fundamental particles and although the final equations were to a certain degree different, the common thought was that there might be a link between α and u_0. A complication arises here from the fact that we have to deal with the SI dimensions without introducing the Coulomb, yet, the numbers are what we expect from this system. To solve the problem we "scale" our charge and time with respect to the unitary time ($t_u = 1$) and charge ($Q_u = 1$). The result is an additional equation for $\alpha = I_u / I_q$ where $I_u = 4\pi^2 Q_u / t_u^{1/2}$ and $I_q = Q_0 / t_0^{1/2}$. The ratio I_u / I_q gives us the possibility to calculate α out of the 3 basic constants only, i.e. c, h and G with a result 0.02% close to the actual value:

$$\alpha = (2\ \pi^2 / c)\ (\pi / c)^{1/2}\ (2\ G / h)^{1/4}\ (c / \pi\ h\ G)^{1/16}$$

where $2\pi^2$ is the quantity $I_u /2$. The fast rotation will tend to increase mass m_0 and the same will apply to charge Q_0 which will reach a final value Q_f at speed u_0, which is close to c. Q_f is a moving charge so we must expect also a magnetic force F_{mag} opposing the electric force F_{ele}; both forces are generated by Q_f but the magnetic force is slightly smaller, as a consequence we will detect only a reduced electric force that we identify as the electron force:

$$Q_f^2 / \varepsilon_0 - \mu_0\ Q_f^2\ u_0^2 = e^2 / \varepsilon_0$$

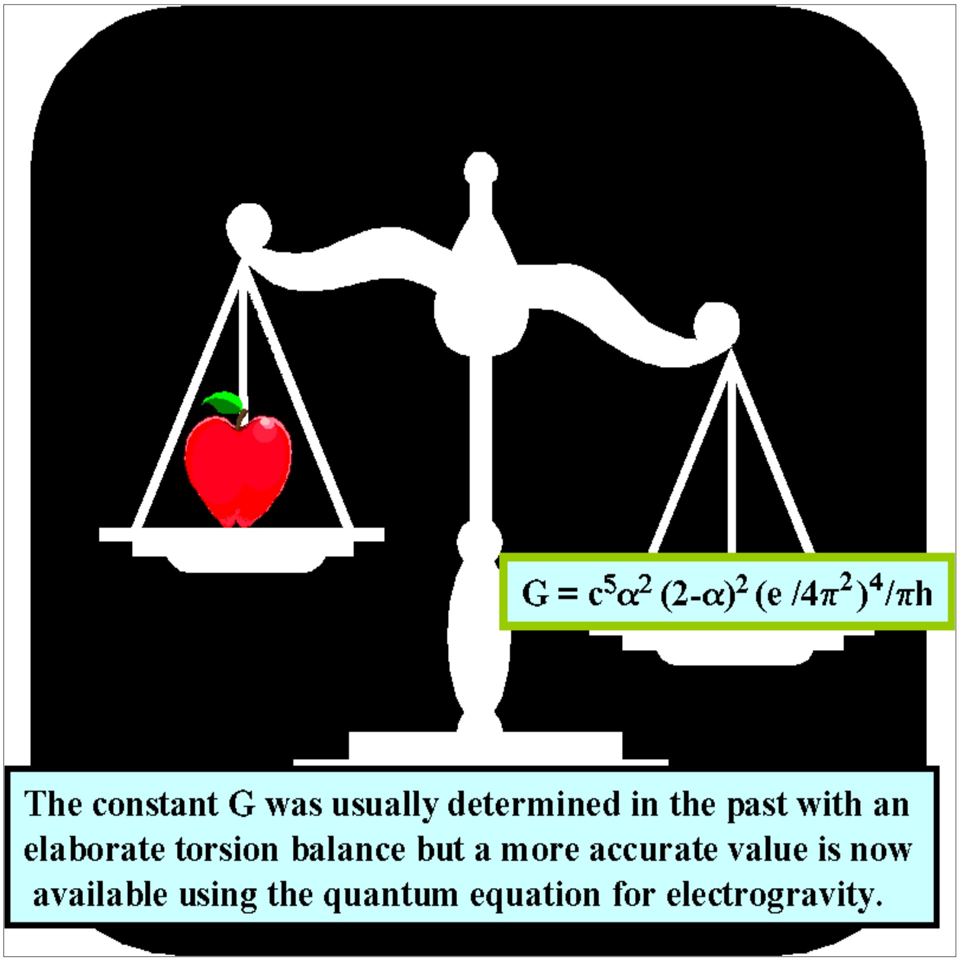
An analysis of all forces involved will give $Q_f = Q_0\ c/u_0$ and an electron charge 0.01% close to the known value:

$$e = Q_f\ (\alpha / 2)^{1/2} = 1.602\text{x}10^{-19}\ \text{m}\ (\text{Kg sec}^{1/4}\ \text{m})^{1/2}/\text{sec}$$

Charge Q_f will set a new value for the permittivity $\varepsilon_0 = Q_f^2/4\ h\ c = 8.858\text{x}10^{-12}\ \text{sec}^{1/4}$ (0.04% off its real value) relevant to a rotating black hole. A strict relationship is thus established between speed u_0, α and the resulting charge e. It must be stressed that from our frame of reference ε_0 would be a dimensionless number because we would not experience the $\text{sec}^{1/4}$ dimension.

THE QUANTUM CONNECTION

So far we have used only 3 basic constants to derive all other quantities and it is tempting to think that it might be possible to obtain the constant of gravitation G from other constants which are known with great accuracy. The advantage is that we would



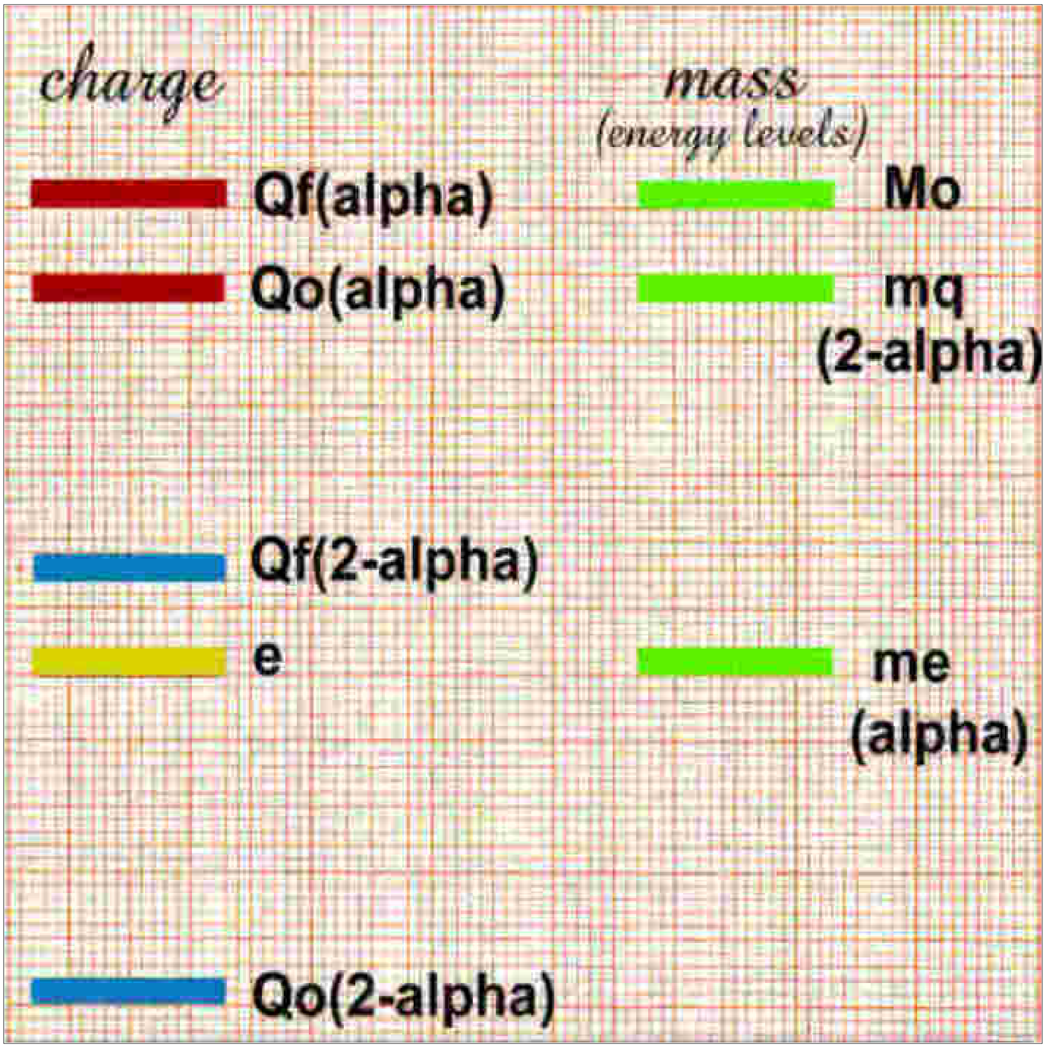
have G with a precision not possible up to now. Of course we would always need an experimental confirmation but this has already happened because this accurate G, first calculated already many years ago, is in strict agreement with today's experimental results. In practice, the value found for G is always decades ahead of the experimental confirmation. It would be interesting to see if the same would hold true using some very old data, from the pre-war era, and see if there is indeed a confirmation of the theoretical result. The equation is arrived at by manipulating all the equations we have seen so far and operating substitutions aimed at writing G using only known constants:

$$G = c^5 \alpha^2 (2 - \alpha)^2 (e / 4 \pi^2)^4 / \pi h$$

The result is 6.672918×10^{-11} $m^3/Kg\ sec^2$. The quantity $4\pi^2$ is the parameter I_u seen in the previous paragraph and the quantity $\alpha(2-\alpha)e^2$ is a constant, independent from speed u_0. The other result, unexpected, is the fact that if we try to solve the equation for α we end up with two quantities: one is the classic fine structure constant α, but there is also another value $\alpha_q = 2-\alpha$ that might play a part in the modeling of another particle because it originates a second lower rotational speed without any change in the charge value. The particle that appears to emerge is the quark and a possible integration within this framework is offered further on.

THE ELECTRON MASS

The drawing below shows how the difference of the squares of Q_f and Q_0 generates the electron charge (squared). The corresponding energy levels are M_0, m_q and m_e respectively, m_e being the measurable electron mass. If the fine structure constant is set equal to $2-\alpha$, we have new values for Q_f and Q_0 but their squared difference is still the electron charge. From the energy point of view, it is now the difference of the squares between M_0 and m_e that generates the measurable mass m_q. We will identify this new particle as the quark.



Normally, the mass that we will able to measure in our frame of reference is the result of the gravitational force taking place in the black hole within time t_0 and the rotational factor, which must be the same as the one used to get the electron charge. If we apply these conditions to Planck's mass m_0 we have the electron mass m_e:

$$m_e = m_0 (t_0 \alpha / 2)^{½} = 9.1x10^{-31} \text{ Kg sec}^{½}$$

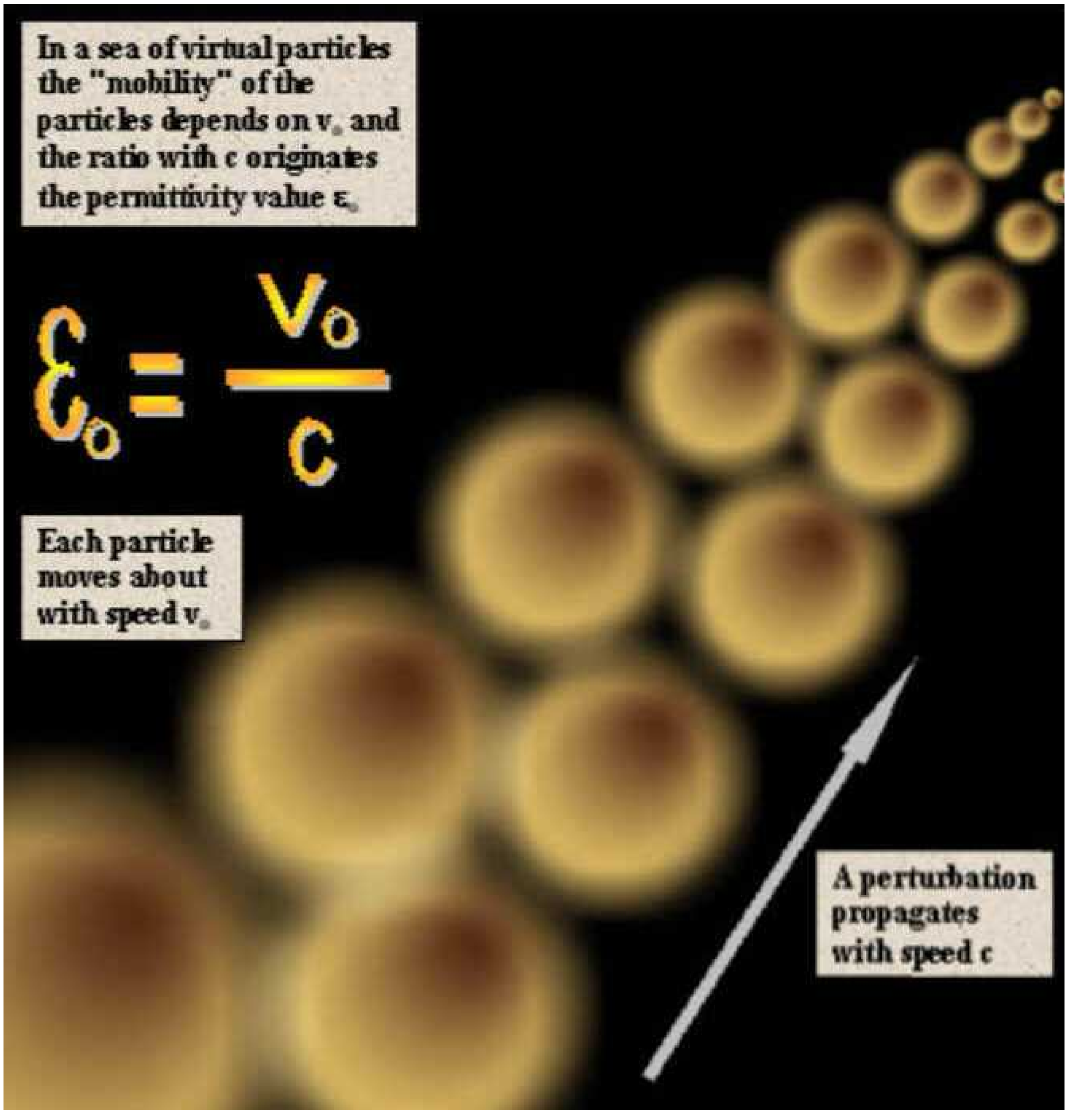
This equation gives us the answer on the link between the very heavy particle m_0 and the light electron mass. There is a time factor that we are unable to measure directly but it is an integral part of the electron mass. If the gravitational force of mass m_0 would exist only for the duration of time t_0, we would have a gravitational force $F_0 = G m_0^2 t_0$ but, for an outside observer, it will look like a steady, time independent, gravitational force $F_0 = G M_0^2$, where $M_0 = m_0 t_0^{½}$, and finally, if rotation is taken in account we have the gravitational force of the electron $F_g = G m_e^2$. It is now possible to give an answer to the initial hypothesis about the ratio F_g / F_e: for a non-rotating black hole (charge = Q_0 and gravitational mass = M_0) the ratio of the gravitational to the electric force F_0 / F_q is equal to t_0 both numerically and dimensionally. Again, we would not be able to measure time t_0 and the ratio would look dimensionless. When rotation is brought in the picture, we find that the change in the parameter values brings about a slight change in the ratio that is now close, but not equal, to t_0. We are now in the same exact situation described at the beginning where we had the ratio F_g / F_e close to t_0. With the manipulation of the equations we are able to write m_e also in terms of charge Q_0 and hence in terms of the electron charge:

$$m_e = (8 h^3 / \pi e^4) (\alpha / 2)^{½} / (2 / \alpha - 1)^2$$

The result is always the same and only 0.116% different from the real value. The difference reduces to 0.025% once speed u_0 is adjusted as explained further on, or, in other words, using the current known values.

THE MYSTERY OF PERMITTIVITY

Permittivity ε_0 is seen, in our equations and in our frame of reference, as a dimensionless number. This should be expected because we are using the dimensions of length, time and mass to describe the charge and the use of the SI system calls for a dimensionless constant in order to return the correct numbers. The implication is that there should be another constant v_0, a velocity, so that $\varepsilon_0 = v_0/c$. Numerically we recognize v_0 as the inverse of the resistance of vacuum, nevertheless the dimension of permittivity requires the identification of speed v_0.



The electron energy $m_e c^2$ is often given as the ratio between its electric force and its radius, however both charge and mass originate from mass m_0 and charge Q_0 and, as a consequence, we should be able to relate the electron energy to the energy of m_0 or Q_0. Because of the uncertainty principle, we will never be able to locate exactly mass m_0: it will move about at a certain speed v_0 so that its kinetic energy is $m_0 v_0^2/2$; this is the only energy level we would be able to measure and would correspond to the electron energy:

$$m_0\, v_0^2 / 2 = m_e\, c^2$$

The equation does not take in account the fact that the left term is a non-rotating particle whereas the right term is a rotating particle. Even with this limitation we get v_0 15% close to its expected value. Further elaboration of the above equation yields:

$$G\, m_e^2 / G\, m_0^2 = v_0^4 / 4\, c^4 \approx \varepsilon_0^4 / 4$$

The gravitational force of mass m_0 could be written also in terms of Q_0 or the electron charge. In order to have a better value, we should consider both particles m_e and m_0 either rotating or non-rotating. If we adjust the equation such that only rotating particles are shown, we get the following result:

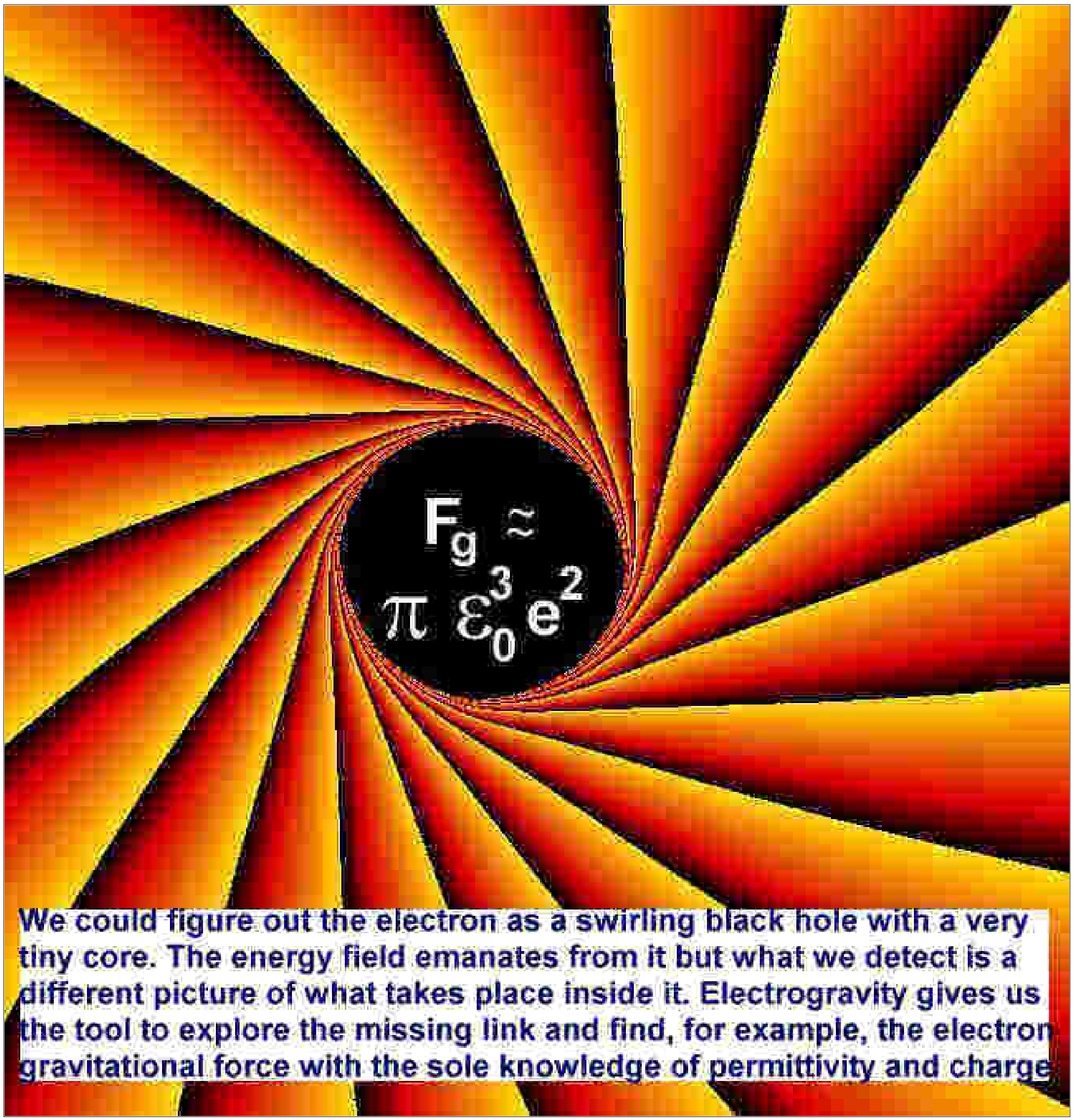
$$F_g / F_e \approx 4\, \pi^2\, \varepsilon_0^4 \approx t_0$$

We see here that Planck's time is directly related to both permittivity and to the ratio of the gravitational to the electric force in an electron. A very accurate value for v_0 is obtained if we write it in terms of electrical quantities:

$$v_0 = e^2 / 2\, \alpha\, h$$

Numerically it is 2.654×10^{-3} and appears to us as a velocity. The same is obtained also from $Q_f^2/4h$ or $Q_0^2/2\alpha_q h$ and should not be difficult to identify it with experiments. It means also that a dimensionless constant, numerically equal to ε_0, will appear in the cgs system once v_0 is found.

THE SWIRLING ELECTRON

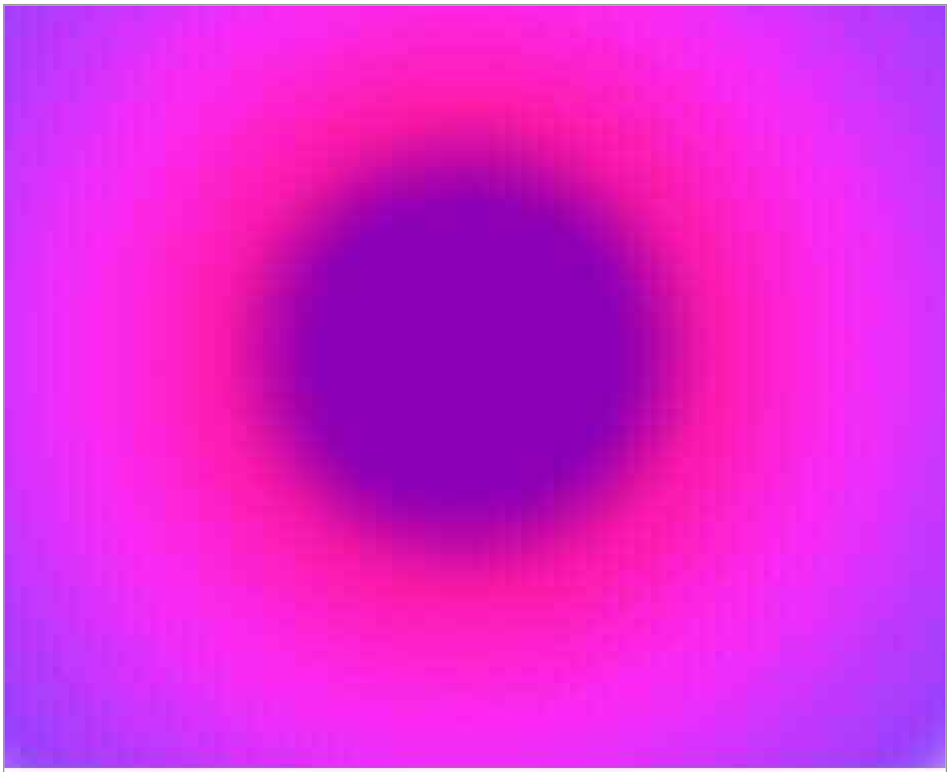


Further manipulation of the equations leads to identify another factor that seems to confirm that the electron is indeed a black hole. The Kerr-Newman condition is satisfied because, for a non-rotating electron, we would have $G M_0^2 = \pi \varepsilon_1^3 Q_0^2$; this equation is numerically and dimensionally correct despite its appearance. For a rotating electron we would have a similar equation because $\varepsilon_0 \approx \varepsilon_1$ and $M_0/m_e \approx Q_0/e$. The result is a relationship which can be written with known constants albeit with a 1% approximation because secondary effects of rotation are disregarded:

$$G m_e^2 \approx \pi \varepsilon_0^3 e^2$$

A time dimension appears on both sides of the equation but from our frame of reference we would experience the classical gravitation force of the electron F_g without the time dimension attached to it. The dimension of Coulomb cannot be applied to Planck's level and a charge expressed only with the dimensions of mass, length and time is a more suitable representation. Only in this way we are able to establish a link between gravity and electricity: they are both of comparable magnitude when they are confined within the black hole but the constraint of the time dimension makes the gravitational force so much smaller when it is measured from our frame of reference.

THE BARE PARTICLE



The sea of virtual particles present in the vacuum are polarized by the intense electric field in the proximity of the charge (reddish color). The result is a slight change of all electron parameters. They all depend on the rotational speed and a decrease of 111 m/sec will bring all quantities, except mass, within known uncertainty.

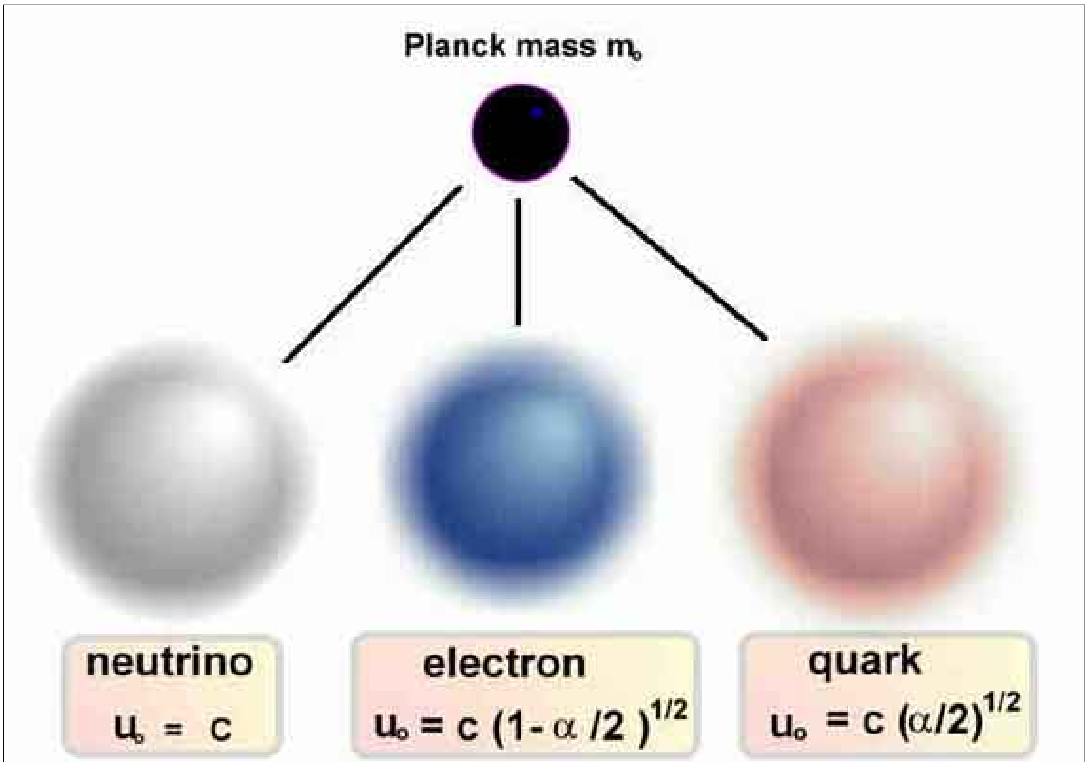
All calculations were executed with a high precision program. Yet, the numbers we get are very close but definitely not within the uncertainty of known values. Speed u_0 is responsible for the discrepancy. If we would be able to slow down this speed by 111.0728 m/sec we would have the right numbers, with the exception of the electron mass that would show still a minute difference. There could be a number of reasons for the slow down but the concept of bare particle seems the most promising: what we have been calculating so far refers to a bare particle but the polarization of vacuum brings about a screening effect on the charge resulting in a lower measurable value. We could think that the polarization induces a "speed drag" of exactly the required amount with the results given in the table below where the numbers show the difference in ppm with known values:

param.	bare particle	with drag
α	- 203	0
ε_o	+ 405	0
m_e	- 1164	- 251
e	+ 101	0

The remaining difference in the electron mass could be explained as the energy necessary to set up the polarization of the vacuum: calculations indicate that this will account for about 80% of the difference. This means that there is probably another unknown mechanism that takes care of the residual 20%.

QUARKS AND OTHER PARTICLES

The value for the fine structure constant is related to the mass of the particle through the rotational speed. If the rotation of the particle is pushed to the limit of the speed of light, we would be left with a massless and chargeless particle. It is not difficult to see the neutrino in the description of this particle.



FAST ROTATION OF THE PLANCK MASS GENERATES THREE FUNDAMENTAL PARTICLES: THE NEUTRINO, SPINNING AT THE SPEED OF LIGHT AND TOTALLY INERT; THE ELECTRON, SPINNING AT A SPEED SLIGHTLY LOWER THAN C AND MILDLY ACTIVE AND THE QUARK, MUCH SLOWER THAN C. IT TAKES PART IN THE MOST VIOLENT AND ENERGETIC NUCLEAR REACTIONS.

Also the second value of the fine structure constant α_q seems to generate another basic particle rotating at a different speed. The resulting entity has a mass m_q and a charge identical to the electron:

$$m_q = m_e\,(\alpha_q / \alpha)^{1/2} = 1.5\text{x}10^{-29}\ \text{Kg} = 8.44\ \text{MeV}$$

This value is within the range of the D (down) quark. Due to the lower rotational speed and the stronger fine structure constant (α_q is 273 times α) we should expect this particle to be particularly reactive, so reactive in fact that it could be found only in its excited state and in combination with other particles. There is an interesting consequence for the model adopted so far concerning the charge: a temporary variation of the rotational speed may generate a fractional charge but it is not clear how it relates to mass and permittivity. An excited state of particular interest is the ρ (Rho) particle; its mass is calculated using the empirical factor $2/3\alpha$:

$$\rho = m_q\,2 / 3\,\alpha = 771.4\ \text{MeV}$$

The value is in line with experimental data and seems to play an important part in the determination of the proton mass.

THE PROTON MASS

The reported mass is explained in terms of the quark structure. The interaction of two U (up) quarks and one D (down) quark could provide the reported mass. The quark enters as another facet of the fundamental particle that generated the electron.

The hypothesis for the proton is that the combination of 3 excited quarks m_q originates a stable configuration at an energy level given by the factor $2/3\alpha$ for each individual quark. The proton mass m_p is then given by the combination of 3 ρ (Rho) particles:

$$K_0 \, m_p = m_q \, 2 / \alpha$$

Where K_0 is an unknown factor, expected to be 1 but in actual fact it must be around 2.5 in order to return the correct numbers. On the other hand, if we accept the idea of the quark structure and knowing that the mass is inversely proportional to the fourth power of the charge, we may write the following relation:

$$(m_p / 3 \, m_q)^{1/4} = K_0$$

With the above equation it was attempted to relate the equivalent proton charge to the equivalent charges of the three quarks making up the proton: we did not get the expected result of 1 but it is now possible to combine the two equations thus originating a relationship for the proton/electron mass ratio:

$$m_p / m_e = 3^{1/5} (2 / \alpha)^{4/5} (2 / \alpha - 1)^{1/2}$$

The resulting number is only 125 ppm different from the known ratio. It is likely that the difference is due to some additional energetic process that might be typical of the proton structure.

THE GRAVITOMAGNETIC EFFECT

The satellite *Gravity Probe B* is set to measure the feeble gravitomagnetic field induced by a rotating mass: the Earth in this case. In this theory we find the same effect in the electron itself. If we look carefully at the equation giving the electron force we find that the magnetic force F_{mag} is also generated by the rotation of Planck's mass m_0 at speed u_0:

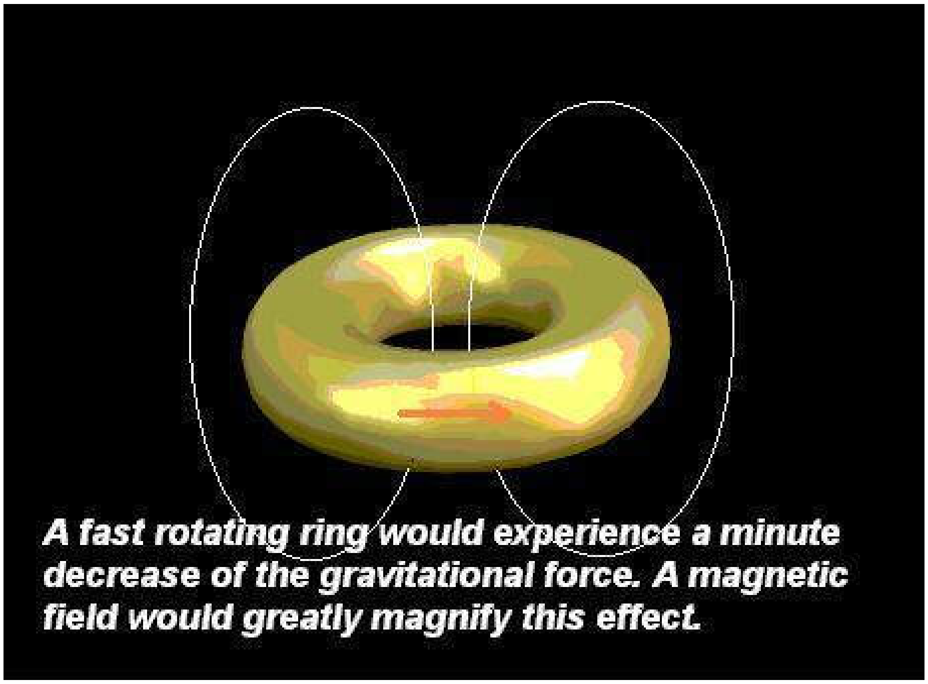
$$F_{mag} = G \, m_0^2 \, u_0^2 / c^2 = G \, m_0^2 (1 - \alpha / 2)$$

This means that the quantity $\mu_0 \, Q_f^2 \, u_0^2 / 4\pi$ could be replaced with the equation shown above without any difference. As a consequence the electric force of the electron could be calculated also in the following way:

$$G \, m_0^2 - G \, m_0^2 (1 - \alpha / 2) = G \, m_0^2 \, \alpha / 2 = e^2 / 4 \, \pi \, \varepsilon_0$$

What the equation says is that the force acting between two rotating masses m_0 is identified by our instruments and in our frame of reference as the electric force between two electrons and measured as such. Definitely not a gravitational force. In light of this last finding, we are able to propose a consequence that covers the intriguing possibility of an antigravitational force.

CLOSING ON ANTIGRAVITY



As far as the gravitational force is concerned, time t_0 is the quantity that represents the transition from the black hole frame of reference to ours. If we apply this concept to the equation relevant to the rotating mass m_0 we would have the following relation:

$$G\, m_0^2\, t_0 - G\, m_0^2\, t_0\, u_0^2 / c^2 = G\, m_e^2$$

This is, in practice, the same equation we found for the electron mass but now we see that its gravitational force is actually composed of two terms and the second one is in *opposition* to the first one: in other words, the equation shows that the faster the mass rotates the weaker its gravitational force becomes. If this line of reasoning could apply to every mass we should expect that *Gravity Probe B* will surely measure a gravitomagnetic force but it will also find that this force is *contrary* to the normal gravitational force. What is more, as the quantity $G\, m_0^2 u_0^2/c^2$ is a force of magnetic origin, we should expect that the antigravity effect is further enhanced if the rotating mass generates a powerful magnetic field as well. Maybe the reported gyroscopic anomalies and the debated Podkletnov experiment have a common ground after all. It must be said also that it is not clear if a fast rotating mass is, on its own, also a screen against an outside gravitational field or the effect is limited only to a decrease of its gravitational force. In any case, this theory should be regarded only as a first step towards the unification of forces that will surely lead to a better understanding of gravity and, as a consequence, pave the way for a theory on antigravity.

MEASURING ANTIGRAVITY

It appears that a rotating mass m_r would undergo a weight reduction when it rotates at speed u so that its final mass m_f is:

$$m_f^2 = m_r^2 - m_r^2\, u^2 / c^2$$

This is deduced from the equation giving the electron mass. Unfortunately any experiment aimed at finding a reduction using the above equation will not be able to detect the infinitesimal change of mass unless the speed is substantially increased with the result that the device will shatter to pieces long before reaching any measurable change. Maybe the situation is different when we are dealing with elementary particles. From a theoretical point of view, if we would manage to rotate a given mass at the speed of light, we would be left with an object with no measurable weight.

The situation improves if we endow the rotating mass with a strong magnetic field. The equation would look now as follows:

$$m_f^2 = m_r^2 - m_r^2\, B_k\, u^2 / c^2$$

Where B_k would be a dimensionless term related to the magnetic field strength of the rotating mass. In this case there is no need to rotate the disk at prohibitively high speed, the weight reduction should be now within reach of our instruments. The reduction could be so strong to render mass m_r weightless, not only, but we could reach a point where, at a certain rotational speed, the right term of the above equation would become negative hinting at the possibility of a real antigravitational force. Recent experiments with superconductive rotating disks, or rings, seem to point to the right direction but further efforts should be made in order to find a weight reduction of the rotating device. Mr Podkletnov with his first Tampere experiment, and his more recent paper, was the first to report a gravitational anomaly although subsequent tests have given conflicting results probably because one did not know what to look for, i.e. any experiment should measure a weight reduction of the rotating disk rather than an elusive shielding effect.

AN ACCURATE CONSTANT OF GRAVITY

The first result of this study was a theoretical constant of gravitation in 1980. The result was a numerical value of

6.673019(127)x10^{-11} (between brackets the uncertainty of the last digits). The calculation was based on the accuracy of data available at that time. We have an improved precision of 6.672918(2)x10^{-11} if we use the most recent *Codata* values. The number for the constant of gravitation G mentioned in the same Codata list is 6.673(10)x10^{-11}. This number is actually a magnitude less accurate than the previously given value of 6.67259(85)x10^{-11}. It was found that some of the *measurements* carried out in the past exclude each other and the National Institute of Standards and Technology (NIST) had no better choice than to increase the uncertainty in order to gather for all the measurements. It is hoped that new experiments based on quantum effects will give a conclusive answer but there are now underlying doubts on the numbers given by present experiments based on classic methods.

At the present there are several experiments being tested in labs around the world, some of them are rather ingenious, all aimed at improving the precision and accuracy of the value of the constant of gravitation. a preliminary value of 6.6739x10^{-11} with an uncertainty of 0.0014% was recently obtained by a group of the university of Washington. These measurements, once refined, should reduce the uncertainty by 10 times.

CONCLUSIONS

When we start to investigate the realm of the Planck mass we experience a collapse of the time dimension. Certain quantities no longer have the dimensions we are used to and this has a ripple effect in our macro world where we find numerically valid results but with an *apparent* dimensional mismatch. However hard we try, we cannot bring the Planck mass in our world if we do not consider the collapse of time near the black hole. We could probably devise some esoteric and complex transformations in order to justify the results but the approach of retaining the known SI numerical values offers us a solution immediately applicable to our daily experience.

The precise and accurate value for the constant of gravitation is being confirmed by experiments and it is likely that future, more accurate measurements will fully confirm the calculated value. The ratio of the proton to the electron mass, though only accurate to 0.01%, is given by an astounding simple equation based only on the fine structure constant. The electron mass can be calculated by means of other quantum constants and its gravitational force can be related directly to the electron charge and permittivity. Even the fine structure constant can be calculated straight from the three initial basic constants: G, c and h.

The scientific community has had a difficult time to find a link between the very heavy particle m_0 (the Planck mass) and the very light atomic and subatomic particles that we find in nature. The solution was the introduction of a new constant, the *strong gravity constant,* which is merely a mathematical artifact devised for the sole purpose of providing the missing link. The solution offered by this theory is to see the Planck mass as a black hole and derive all the basic particles from a description of its peculiarities. We have seen that there is no need for the *strong gravity constant* because the particles themselves, including the electron, are in fact tiny black holes.

References:

Di Mario, D. (1997) Electrogravity: a basic link between electricity and gravity. *Speculations in Science and Technology***,** vol. **20**, issue 4, p. 291-296. Chapman & Hall, London.

Schiller, C. (1996) Does matter differ from vacuum? *preprint server*

Oakley, W.S. (1995) Gravity and Quarks. *Speculations in Science and Technology*, vol. **18**, issue 1, p. 44-50. Chapman & Hall, London.

Spaniol, C. and Sutton, J.F. (1992) Classical electron mass and fields, Part II, *Physics Essay*, vol. **5**(3), p. 429-430

Di Mario, D. (1980) Inertia of the electron, letters. *Wireless World*, vol. **86,** December, p. 85. IPC Business Press Ltd. London.

Sivaram, C. and Sinha, K.P. (1979) Strong spin-two interaction and general relativity. *Physics Reports*, vol. **51**, p. 113-183

Sivaram, C. and Sinha, K.P. (1977) Strong gravity, black holes, and hadrons. *Physics Review D*, vol. **16** (6), p. 1975-1978

Motz, L. (1972) Gauge Invariance and the quantization of mass. *Il Nuovo Cimento*, vol. **12B** (2), p. 239-255

Journal Home Page

email: mail@journaloftheoretics.com