

# Ferent Gravitation theory

Adrian Ferent

This is a new gravitation theory which breaks the wall of Planck scale.

## Abstract

### My Nobel Prize - Discovery

“The Photon – Graviton pair (coupled) has the same speed and frequency, and the photon energy divided by the graviton energy is the electromagnetic energy divided by the gravitational energy, the electromagnetic force divided by the gravitational force.” Adrian Ferent

This helped me to go beyond the Planck wall.

It is our ultimate task to discover a new quantum theory which breaks the wall of Planck scale and creates a new frontier.

I found another wall, the Ferent wall beyond the Planck wall, where the Planck constant  $h=6.62606957 \times 10^{-34}$  J·s is replaced by Ferent constant  $a = 1.590511178 \times 10^{-76}$  J·s.

I replaced Max Planck equation  $E = h \times f$  with the Ferent equation for the energy of a photon:  $E = h \times f + a \times f$

“Because Special relativity is wrong can not be applied to the Graviton with an energy much smaller than the photon energy” Adrian Ferent

I discovered the impulse of the graviton:  $p = a / \lambda$

I replaced Heisenberg Uncertainty Principle  $\Delta p \times \Delta x \geq h / 4\pi$  with Ferent Uncertainty Principle:  $\Delta p \times \Delta x \geq a$

I discovered a new electromagnetic theory.

In my view the electromagnetic wave is the superposition of 3 sinusoids, because the photon has relativistic mass and travels with a coupled graviton.

The graviton has negative impulse, negative mass and negative energy.

I am the first who understood and explained that the gravitons with the speed of light,  $c = 2.9979 \times 10^8$  m/s, are too slow to keep the constellations and the galaxy together. I explained the Gravitation with high speed gravitons,  $v_a = 1.001762 \times 10^{17}$  m/s.

Ferent gravitational force function:

$$F = \int_{-\infty}^{\infty} G \frac{m_1(t)m_2(t)}{r^2(t)} \delta\left(t - \frac{r(t)}{v(t)}\right) dt$$

I calculated the volume of the universe at Planck wall,  $V_P = 5.819 \times 10^{-45}$  m<sup>3</sup> and the volume of the universe at Ferent wall,  $V_F = 3.355 \times 10^{-130}$  m<sup>3</sup>

My quantum gravity theory shows that the gravitons are too small to be detected by today's technology.

“Lorentz, Poincaré, Einstein’s Special relativity is incorrect because is limited to the speed of light and to the photon energy” Adrian Ferent

Because the escape velocity of the black hole is bigger than the speed of light, I calculated:

“I am the first who understood and explained the Gravitation with high speed gravitons  $v = 1.001762 \times 10^{17}$  m/s, with Negative Impulse, Negative Mass and Negative Energy”

Adrian Ferent

That is why:

“Einstein, Hilbert General relativity theory, String theory, LQG, all Quantum gravity theories are incorrect because are limited to the speed of light” Adrian Ferent

## 1. Introduction

All the gravitation theories are limited to the speed of light. In these theories the speed of gravitations (gravitons) is equal with the speed of light.

In my view the perturbation done by the photon in a gravitational field is equal with one graviton. Because light has gravitational property, light is deviated by mass; from here I started a new electromagnetic theory. So decoherence is due to the gravitational field, to the gravitational waves generated by the observer.

The perturbation of a photon in the gravitational field is a graviton with the same frequency and speed as the photon has; but the gravitons in my theory that mediates the gravitational force, the gravitons which mediates the interaction force have different frequencies when the photon travels near an asteroid, near the Earth or near the Sun.

The electromagnetic force divided by the gravitational force is the photon energy divided by the graviton energy.

This brought me to another wall beyond the Planck wall, with a length smaller than the Planck length.

How about the graviton speed?

I realized that the speed of light is too small for the graviton speed. If the graviton has only the speed of light, because the black hole escape velocity is higher than the speed of light, my conclusion was: the graviton speed is much higher than the speed of light.

I discovered the Ferent gravitational force function.

Gravitational fields are conservative; the work done by gravity from one position to another is path-independent.

## 2. My theory

The oscillation of an electron emits, radiates to space a photon and a coupled graviton, with the same speed, the speed of light and the same frequency.

The energy  $E$  contained in a graviton, which represents the smallest possible 'packet' of energy in a gravitational wave, is the 'a' the Ferent constant times the frequency.

In my view the electromagnetic wave is the superposition of 3 sinusoids, because the photon has relativistic mass and travels with a coupled graviton.

I discovered a new gravitation theory and I found how the gravitation and the gravitons emerged at first Ferent wall. Here the gravitons have the speed equal with the speed of light and the Ferent length  $l_a = 7.918359 \times 10^{-57}$  m.

Why gravitons faster than the speed of light?

Because I am the first in the world who understood and explained that the gravitons with the speed of light are too slow to keep the constellations together. The gravitons with the speed of light are too slow for the escape velocity of a black hole.

During the Big Bang first emerged the gravitational force with the speed of the gravitons:

$$v_a = 1.0017620 \times 10^{17} \text{ m/s}$$

These gravitons with the speed much bigger than the speed of light at the second Ferent wall have negative impulse, negative mass and negative energy.

At the second Ferent wall, the Ferent length  $l_F = 1.296 \times 10^{-69} \text{ m}$ .

### **The energy E of a photon**

Planck discovered that physical action could not take on any indiscriminate value. Instead, the action must be some multiple of a very small quantity called Planck constant.

The Planck constant is a physical constant that is the quantum of action, describing the relationship between energy and frequency.

The energy E contained in a photon, which represents the smallest possible 'packet' of energy in an electromagnetic wave, is Planck's constant times the frequency:

$E = \text{Planck's constant} \times \text{frequency}$ .

$$E = h \times f$$

Max Planck equation for the energy of a photon  $E = h \times f$  is incorrect because does not contains the energy of the graviton, because light has gravitation!

Ferent equation for the energy of a photon:

$$E = h \times f + a \times f$$

Where h – is the Planck constant  $h = 6.62606957 \times 10^{-34} \text{ J}\cdot\text{s}$  and a – is the Ferent constant  $a = 1.590511178 \times 10^{-76} \text{ J}\cdot\text{s}$

The electromagnetic field is a physical field that is produced by electrically charged objects.

However, the gravitational force is extremely weak when compared to the electromagnetic force. In fact it is only about 1/s of the strength of the electromagnetic force.

$$s = 4.166 \times 10^{42}$$

### **Electromagnetic radiation**

Light is part of a group of phenomena collectively known as electromagnetic radiation. All members of the group can be created by accelerating electric charges, usually electrons.

Radiation occurs whenever electric charge is accelerated. Radio and television signals are caused by electrons accelerating in radio antennas.

The electric and gravitational fields are quite similar.

Electrons are the smallest parts of the atom, they have the smallest mass.

The oscillation of an electron emits, radiates to space a photon.

Therefore photons have gravity, because they have relativistic mass.

### 3. My electromagnetic theory

In my view the electromagnetic wave is the superposition of 3 sinusoids, because the photon has relativistic mass and travels with a coupled graviton:

The Photon – Graviton pair (coupled) has the same speed and frequency and the solutions of Ferent electromagnetic equation:

$$E(r, t) = E_0 \cos(\omega t - kr + \varphi_0)$$

$$B(r, t) = B_0 \cos(\omega t - kr + \varphi_0)$$

$$g(r, t) = g_0 \cos(\omega t - kr + \varphi_0)$$

This means the Ferent electromagnetic equation:

$$\frac{\partial^2 E}{\partial t^2} - c^2 \nabla^2 E = 0 \quad \frac{\partial^2 B}{\partial t^2} - c^2 \nabla^2 B = 0 \quad \frac{\partial^2 g}{\partial t^2} - c^2 \nabla^2 g = 0$$

My equations:

$$\frac{1}{E_0} \frac{\partial E}{\partial t} = \frac{1}{g_0} \frac{\partial g}{\partial t}$$

A changing electric field generates a changing gravitational field and both sinusoids have the same derivative divided by their amplitude.

$$\frac{1}{B_0} \frac{\partial B}{\partial t} = \frac{1}{g_0} \frac{\partial g}{\partial t}$$

A changing magnetic field generates a changing gravitational field and both sinusoids have the same derivative divided by their amplitude.

#### Gravitoelectromagnetism

According to general relativity, the gravitational field produced by a rotating object or any rotating mass–energy, can be described by equations that have the same form as in classical electromagnetism.

I will replace the speed of light  $c$  with the Ferent speed  $v_a$  for the gravitons.

$$\nabla \cdot E_g = -4\pi G \rho_g$$

$$\nabla \cdot B_g = 0$$

$$\nabla \times E_g = -\frac{\partial B_g}{\partial t}$$

$$\nabla \times B_g = -\frac{4\pi G}{v_a^2} J_g + \frac{1}{v_a^2} \frac{\partial E_g}{\partial t}$$

where:

$E_g$  - the static gravitational field

$B_g$  - the gravitomagnetic field

$\rho_g$  - the mass density

$J_g$  - the mass current density or mass flux

$G$  - the gravitational constant

Gravitational flux is a surface integral of the gravitational field over a closed surface:

$$\oiint_{\partial V} g \cdot dA = -4\pi GM$$

where:

$g$  - the gravitational field

$\partial V$  - is any closed surface (the boundary of a closed volume  $V$ )

$dA$  - is a vector whose magnitude is the area of an infinitesimal part of the surface  $\partial V$  and whose direction is the outward-pointing surface normal

$M$  - is the total mass enclosed within the surface  $\partial V$

### **Decoherence explained by my theory**

The electromagnetic wave is the superposition of 3 sinusoids; this means the electromagnetic wave will be collapsed by the presence of an electric field, of a magnetic field, of a gravitational field, by another electromagnetic wave...

In my electromagnetic theory, gravity does collapse quantum superpositions, gravity bends light because light has 3 sinusoids, has a gravitational sinusoid!

In Maxwell electromagnetic theory, gravity does not collapse quantum superpositions, gravity does not bend light, because light has only 2 sinusoids!

So decoherence is due to the gravitational field, for example to the gravitational waves generated by the observer in the double-slit experiment.

## 4. The Ferent wall

### Field

Field is a physics term for a region that is under the influence of some force that can act on matter within that region.

The electromagnetic field is mediated by the exchange of photons.

The gravitational field is mediated by the exchange of gravitons.

For example, the Sun produces a gravitational field that attracts the planets in the solar system and thus influences their orbits.

### The ratio s

The magnetic force always acts at right angles to the motion of a charge, it can only turn the charge, it cannot do work on the charge.

The strength s, of the electromagnetic force relative to gravity force:

$$s = \frac{F_e}{F_g} = \frac{k_e q_e^2}{G m_e^2} = \frac{(8.99 \times 10^9)(1.60 \times 10^{-19})^2}{(6.67 \times 10^{-11})(9.10 \times 10^{-31})^2}$$

$$s = 4.166 \times 10^{42}$$

With 's' I calculated the Ferent constant.

### Gravitation

Gravitation is a phenomenon by which all things attract one another including sub-atomic particles, planets, stars and galaxies.

The four fundamental forces: the gravitational force, the electromagnetic force, the strong nuclear force and the weak nuclear force are the four fundamental forces.

The gravitational force is mediated by a massless particle called the graviton.

Because gravitation is an inverse square force of apparently infinite range it can be implied that the rest mass of the graviton is zero.

Gravitational fields are conservative; the work done by gravity from one position to another is path-independent.

### The 'a' constant

The electric and gravitational fields are quite similar.

In my view, the energy E contained in a graviton, which represents the smallest possible 'packet' of energy in an gravitational wave, is the 'a' constant times the frequency

$$E = a \times f$$

Now I consider the case of a photon and of a coupled graviton with the same frequency and the same speed emitted by an electron.

Because the strength, of the electromagnetic energy relative to gravity energy it is the strength  $s = 4.166 \times 10^{42}$ , the photon energy  $E_p = h \times f$ , divided by the graviton energy  $E_g = a \times f$  it is  $s = 4.166 \times 10^{42}$

## The value of 'a'

We have  $s = h / a$

Adrian Ferent constant  $a = h / s$

The Planck constant  $h = 6.62606957 \times 10^{-34}$  J·s

This means the Ferent constant:

$$a = 1.590511178 \times 10^{-76} \text{ J}\cdot\text{s}$$

## The impulse of the graviton

The impulse of a photon:  $p = h / \lambda$

The impulse of the graviton:  $p = a / \lambda$

I derived this equation from the Klein–Gordon equation.

Because the graviton has the rest mass equal to zero and the speed is equal to the speed of

light:  $E = p \times c$

$E = a \times f$  from here  $p \times c = a \times f$ , and because  $f / c = 1 / \lambda$ , we have:

The impulse of the graviton:

$$p = a / \lambda$$

That is why the gravitons are too small to be detected by today's technology.

## The Uncertainty Principle

Heisenberg Uncertainty Principle is limited for gravitons!

$$\Delta p \times \Delta x \geq h / 4\pi$$

Ferent Uncertainty Principle:

$$\Delta p \times \Delta x \geq a / 4\pi$$

From this equation:  $p = a / \lambda$  by substituting  $\Delta x$  for  $\lambda$  :

$\Delta p \times \Delta x = a$  this means  $\Delta p \times \Delta x \geq a$ , much stronger inequality than the Heisenberg uncertainty principle.

This means  $\Delta p \times \Delta x > a / 4\pi$  and in the same way like in the case of Heisenberg Uncertainty Principle, this equation can be refined to  $\Delta p \times \Delta x \geq a / 4\pi$

The Uncertainty Principle implies that the gravitational field cannot be measured to arbitrary accuracy. The measured strength can only be given as an average over a spacetime region and not at individual spacetime points.

## The energy of the graviton

Because  $E = a \times f$  and  $p \times c = a \times f$ ;  $p = m \times c$ ;  $m$  – the relativistic mass of the graviton.

The energy of the graviton:  $E = m \times c^2$

### **The Ferent length**

Using the same equations as for the Planck units I can calculate all the units at Ferent wall.

Gravitational constant  $G = 6.67384 \times 10^{-11} \text{ m}^3 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}$

The Ferent length  $l_a = 7.918359 \times 10^{-57}$  meters

$$l_a = \sqrt{\frac{aG}{c^3}}$$

### **The Ferent wall**

I found another wall the Ferent wall beyond the Planck wall, where the Planck constant  $h = 6.62606957 \times 10^{-34} \text{ J}\cdot\text{s}$  is replaced by Ferent constant  $a = 1.590511178 \times 10^{-76} \text{ J}\cdot\text{s}$ .

I replaced Max Planck equation  $E = h \times f$  with the Ferent equation for the energy of a photon:  $E = h \times f + a \times f$

I discovered the impulse of the graviton:  $p = a / \lambda$

I replaced Heisenberg Uncertainty Principle  $\Delta p \times \Delta x \geq h / 4\pi$  with Ferent Uncertainty Principle:  $\Delta p \times \Delta x \geq a$

The energy of the graviton:  $E = m \times c^2$

The Ferent length  $l_a = 7.918359 \times 10^{-57} \text{ m}$

I discovered a new electromagnetic theory.

At Ferent wall emerged the gravitation and the gravitons with the energy  $E_g = a \times f$  and the speed equal with the speed of light. Now I can calculate using the same equations from the Planck wall for the Planck units, the Ferent length, the Ferent time, the Ferent energy...I can define very well the Ferent wall!

During the Big Bang first emerged the gravitational force at Ferent wall and after that the electromagnetic force, the strong nuclear force and the weak nuclear force.

This means I discovered a new gravitation theory and I found how the gravitation and the gravitons emerged at Ferent wall!

I can stop here with my gravitation theory.

Why to go beyond, what I considered it is limited is the speed of the gravitons equal with the speed of light.

Why gravitons faster than the speed of light?

## **5. Faster than speed of light!**

I am the first in the world who understood and explained that the gravitons with the speed of light are too slow to keep the constellations together. The gravitons with the speed of light are too slow for the escape velocity of a black hole. The black hole escape velocity exceeds that of light.



I discovered the graviton: the impulse of the graviton, the energy of the graviton, the speed of the graviton, the frequency of the graviton, the mass of the graviton.

First problem: If the gravitons have the speed of light will not be able to keep the constellations together.

Second problem: the black hole has the escape velocity higher than the speed of light, this means the gravitons will not escape and the black holes will not attract anything.

These two problems convinced me that the gravitons have the speed much higher than the speed of light. The warping of the spacetime is an effect of perturbation, not an interaction how I explained in my theory.

That is why General relativity theory, String theory, LQG...are wrong because are limited to the speed of light.

### **Special theory of relativity**

In the second part of the 19th century, physicists were search for the mysterious thing called ether, the medium they thought existed for light waves to wave through. The idea of ether had caused a mess of things in Einstein's view, by introducing a medium that caused certain laws of physics to work in a different way depending on how the observer moved relative to the ether. Einstein just removed the ether completely and assumed that the laws of physics, including the speed of light, worked the identical regardless of how you were moving.

The theory was based on two principles:

The principle of relativity: The laws of physics don't change, even for objects moving in inertial (constant speed) frames of reference.

The principle of the speed of light: The speed of light is the same for all observers, regardless of their motion relative to the light source.

Special theory of relativity implies a wide range of consequences, which have been experimentally verified including length contraction, time dilation, relativistic mass, a universal speed limit the speed of light...

Special theory of relativity is "special" in that it only applies in the special case where the curvature of spacetime due to gravity is negligible. In order to include gravity, Einstein and Hilbert formulated general relativity in 1915.

If you move fast enough through space, the observations that you make about space and time differ to some extent from the observations of other people, who are moving at different speeds.

### **Time dilatation**

The rate of a single moving clock indicating its proper time  $t_0$  is lower with respect to two synchronized resting clock indicating time  $t$ .

The formula for determining time dilation in special relativity:

$$t = \gamma(v)t_0$$

where:

$t_0$  - is the proper time, the time interval between two co-local events  
 $t$  - is the time interval between those same events, as measured by another observer, moving with velocity  $v$  with respect to the former observer  
 $\gamma(v)$  - is the Lorentz factor

$$t = \frac{t_0}{\sqrt{1 - \frac{v^2}{c^2}}}$$

This means the duration of the clock cycle of a moving clock increased, it is measured to be running slow.

### **Length contraction**

Length contraction can be derived from time dilatation.  
 Length contraction is the phenomenon of a decrease in length of an object as measured by an observer which is traveling at any non-zero velocity relative to the object and it is usually only noticeable at a substantial fraction of the speed of light.

$$l = \frac{l_0}{\gamma(v)}$$

where:

$l_0$  - is the proper time (in its rest frame),  
 $l$  - is the length observed by an observer in relative motion  
 $\gamma(v)$  - is the Lorentz factor

This means the length contraction:

$$l = l_0 \sqrt{1 - \frac{v^2}{c^2}}$$

where:

$v$  - is the relative velocity between the observer and the moving object  
 $c$  - is the speed of light

Length contraction refers to measurements of position made at simultaneous times according to a coordinate system.

“Lorentz, Poincaré, Einstein’s Special relativity is incorrect because is limited to the speed of light and to the photon energy” Adrian Ferent

### **Tachyonic antitelephone**

A tachyonic antitelephone is a hypothetical device in theoretical physics that could be used to send signals into one's own past.

Albert Einstein in 1907 presented a thought experiment of how faster-than-light signals can lead to a paradox of causality, which was described by Einstein and Arnold Sommerfeld in 1910 as a means "to telegraph into the past".

The same thought experiment was described by Richard Chace Tolman in 1917; thus, it is also known as Tolman's paradox.

Einstein (and similarly Tolman) concluded that this result contains in their view no logical contradiction; he said, however, it contradicts the totality of our experience so that the impossibility to have a speed higher than the speed of light  $c$  seems to be sufficiently proven.

This is another proof that using Special theory of relativity will bring wrong results.

## **Big Bang**

General relativity predicts the existence of spacetime singularities.

My theory is the same if the universe did not start with the Big Bang. My gravitation theory explains what happened at Ferent wall and after the expansion of the Universe attains the Ferent wall.

Two important walls:

The Ferent wall: here at time  $t = 1.294 \times 10^{-86}$  s were created Ferent matter and gravitons with the speed of the gravitons  $v_a = 1.001762 \times 10^{17}$  m/s.

The Planck wall: here at time  $t = 5.391 \times 10^{-44}$  s were created matter and photons, with the speed of the photons  $c = 2.997924 \times 10^8$  m/s.

## **Einstein field equations**

General relativity is the geometric theory of gravitation published by Einstein and the current description of gravitation in modern physics.

General relativity generalizes special relativity and Newton's law of universal gravitation, providing a unified description of gravity as a geometric property of space and time.

General relativity is a metric theory of gravitation.

Einstein's field equations:

$$R_{\mu\nu} - \frac{1}{2}Rg_{\mu\nu} = \frac{8\pi G}{c^4}T_{\mu\nu}$$

On the left-hand side is the Einstein tensor, a specific divergence-free combination of the Ricci tensor and the metric.

The right-hand side of the field equations describes matter sources, the behaviour of which is governed by quantum theory. The left-hand side of the field equations describes gravitation as a classical field. If the right-hand side represents quantized matter then the field equations as they stand are inconsistent.

On the right-hand side, is the energy–momentum tensor and contains the speed of light.

“Einstein, Hilbert General Relativity theory, String theory, LQG, all Quantum gravity theory are incorrect because are limited to the speed of light” Adrian Ferent

The Einstein (Hilbert) field equations can be interpreted as a set of equations dictating how matter/energy determines the curvature of spacetime.

Einstein reinterpreted the gravity not as a force pulling on objects but as a curvature of spacetime.

For Einstein objects falling in a gravitational field like around the Earth aren't being pulled but are simply moving along geodesics in the warped spacetime surrounding the Earth.

For Einstein, the ball falls because spacetime is curving, not because there is a force pulling it back to Earth!

Einstein was erroneous, because in my view, the gravitons, with high speed  $v_a$  moving in the gravitational field are the force carriers!

### Discrete space

Today we know that the space is not an infinitely divisible continuum, it is not smooth but granular and Planck length and Planck volume gives the size of its smallest possible grains.

Planck length,  $l_p = 1.616199 \times 10^{-35}$  m

Planck volume,  $l_p^3 = 4.22419 \times 10^{-105}$  m<sup>3</sup>

### Conservation of Energy

The law of conservation of energy states that the total energy of an isolated system cannot change in time.

The Planck energy is nature's maximum allowed matter energy for point-energy (quanta). During the Big Bang, this means the Ferent energy, at Ferent wall, is equal with the Planck energy.

From here I calculated the speed of a free (not coupled) graviton!

### The speed of the graviton

The speed of the graviton  $v_a$ , where  $\underline{a} = a/2\pi$

Gravitational constant  $G = 6.67384 \times 10^{-11}$  m<sup>3</sup> · kg<sup>-1</sup> · s<sup>-2</sup>

$$\sqrt{\frac{av_a^5}{G}} = \sqrt{\frac{\hbar c^5}{G}}$$

From this equation the speed of the graviton is  $v_a = 1.001762 \times 10^{17}$  m/s much faster than the speed of light!

### Ferent volume

Ferent length:  $l_F = 1.296 \times 10^{-69}$  m

Ferent volume  $l_F^3 = 2.18 \times 10^{-207}$  m<sup>3</sup>

$$l_F = \sqrt{\frac{aG}{v_a^3}}$$

**Ferent time**

Ferent time  $t_F = l_F / v_a = 1.294 \times 10^{-86}$  s

$$t_F = \sqrt{\frac{aG}{v_a^5}}$$

**Ferent frequency**

Ferent frequency  $f_F = 1 / t_F = 7.728 \times 10^{85}$  Hz

**Ferent energy**

Ferent energy  $E_F = \underline{a} \times f_F = 1.956 \times 10^9$  J

$$E_F = \sqrt{\frac{av_a^5}{G}}$$

**Ferent mass**

Ferent mass  $m_F = E_F / v_a^2 = 1.949 \times 10^{-25}$  kg

**Ferent density**

Ferent density  $\rho_F = m_F / l_F^3 = 8.94 \times 10^{181}$  kg/m<sup>3</sup>

$$\rho_F = \frac{v_a^5}{\underline{a}G^2}$$

**The volume of the universe**

Mass of the universe:  $M = 3 \times 10^{52}$  kg

The volume of the universe at Planck wall:

$$V_P = M / \rho_P = 3 \times 10^{52} \text{ kg} / 5.155 \times 10^{96} \text{ kg/m}^3 = 5.819 \times 10^{-45} \text{ m}^3$$

The volume of the universe at Ferent wall:

$$V_F = M / \rho_F = 3 \times 10^{52} \text{ kg} / 8.94 \times 10^{181} \text{ kg/m}^3 = 3.355 \times 10^{-130} \text{ m}^3$$

This means at Ferent wall the volume of the Universe was smaller than the atom volume.

This means between Ferent wall and Planck wall the universe expanded  $V_P / V_F = 1.546 \times 10^{85}$  times in a period  $t = t_P - t_F = 5.391 \times 10^{-44}$  s.

**Dark matter**

At Ferent wall due to the extraordinarily small scale of the universe at that time, gravitation was the only physical interaction.

At Ferent wall were created Ferent matter and gravitons.

What is Ferent matter?

Ferent density  $\geq$  Ferent matter density  $>$  Planck density

$8.94 \times 10^{181} \text{ kg/m}^3 \geq$  Ferent matter density  $> 5.155 \times 10^{96} \text{ kg/m}^3$

That is why Ferent matter particles do not carry any electric charge.

Only a small percentage of Ferent matter becomes matter at Planck wall. Ferent matter is 84.5% of the total matter in the universe.

The majority of Ferent matter is the core of the supermassive black hole, in the center of each galaxy. Ferent matter plays a central role in galaxy formation and evolution.

At the largest-size scales dark matter dominates the dynamics of galaxy clusters and superclusters.

How you can see the properties of Ferent matter are the properties of dark matter!

Dark matter is similar to Ferent matter, interacts only gravitationally.

My gravitation theory explains dark matter!

### **Proposed quantum gravity theories: String theory, LQG**

There have been numerous theories of gravitation since ancient times.

The graviton in String theory is a closed string with the length of couple Planck lengths.

This means the graviton is gigantic that is why the String theory is limited to the speed of light!

LQG: the predicted size of this structure is the Planck length.

According to this theory, there is no meaning to distance at scales smaller than the Planck scale.

My quantum gravity theory breaks the wall of Planck scale.

A fundamentally geometric nature for gravitation would mean that a completely rigorous unification of all fields is not possible.

Anyway there are numerous quantum gravity theories, but all of them are limited to the speed of light.

### **My quantum gravity theory and information**

In the beginning was the qubit.

At the beginning was the qubit of information.

In my view the information of our universe is in the gravitational field carried by gravitons (qubits).

Only a small part of the information is carried by photons.

The gravitons were not detected because they have a very small energy; the gravitons are too small to be detected by today's technology.

The light can not escape from the black hole, but the small gravitons with high speed and high frequency can very easy go through the event horizon.

In my view the gravitons with high speed and high frequency carry the black hole information!

## Quantum entanglement explained

Quantum entanglement explains that information moves faster than light. If we have two electrons close together, they can vibrate in unison, entangled electrons, according to quantum theory.

If we then separate them an invisible cord emerges and connects the two electrons, even though they may be separated by many light years.

If we jiggle one electron, the other electron 'senses' this vibration faster than the speed of light. Einstein named 'spooky action at a distance'; he thought that this contradicts the quantum theory, since nothing can go faster than light.

In my view when the electron is jiggled it is a change in the gravitational field and the gravitons with a speed  $v_a = 1.0017620 \times 10^{17}$  m/s faster than the speed of light will change the state of the entangled electron.

## 6. Gravitons with negative impulse, negative mass and negative energy

At Ferent wall started our Universe: matter has positive energy and the gravitational field has negative energy. If the two values cancel out, the universe has zero energy and can theoretically last forever.

The negative energy (- E) is needed to offset the positive energy +E of matters, negative gravitational potential energy offset positive energy.

$$E = 0 = +E + (- E)$$

$$E = (\sum + mc^2) + (\sum \frac{-GMm}{r})$$

The gravitons give a negative impulse to mass-carrying particles to attract them!

This means the impulse of the graviton is negative  $p = - m \times v$  and I calculated the speed of the graviton  $v_a$ . Because the impulse is negative, the relativistic mass - m of the graviton is negative!

If the relativistic mass m of the graviton is negative, this implies that the energy of the graviton is negative,  $E = - m \times v^2$  !

Gravitational fields are conservative; the work done by gravity from one position to another is path-independent.

Conservative vector field is a vector field that is the gradient of a scalar potential  $V(r)$ .

Gravitational field:  $g(r) = - \nabla V(r)$

Conservative vector fields have the property that the line integral is path independent, this means the choice of integration path between any point and another does not change the result.

### Negative mass

Negative mass possess this property, such as accelerating in the direction opposite of applied force.

Negative mass is mathematically consistent and introduces no violation of conservation of momentum or energy.

Newton's law of universal gravitation states that any two bodies both with positive mass or both with negative mass in the universe attract each other. But in the case of both bodies having negative mass the motion will be repulsive.

For two gravitons the equation:

$$-m\vec{a} = -G \frac{(-m)(-m)}{r^2} \hat{r}$$

Two objects with negative mass would accelerate away from each other, they repel each other.

This means the gravitons repel each other because they have negative mass.

Another case: a negative mass (energy) less massive (talking about absolute values here) than a positive mass body, is accelerated in the direction of positive mass body and it would move much faster and will 'catch up' with the positive mass body (attractive effect).

Positive mass has attractive effect on each other so it forms planets, stars and galaxies.

Negative mass has repulsive effect on each other so it can not form planets, stars and galaxies.

Positive mass–Ferent matter and negative mass-gravitons emerged together at Ferent wall in the energy and momentum conservation state.

Negative masses because of repulsive effect are uniformly distributed in space.

Uniformly distributed negative mass receive attractive effect from massive positive mass, this is gravitation.

The expansion of the universe takes place because of negative mass repulsive effect.

### **Conservation of impulse and conservation of energy**

My theory is completely mathematically consistent and introduces no violation of conservation of momentum or energy. We have two masses equal in magnitude but opposite in sign, and then the momentum of the system remains zero if they both travel together and accelerate together, no matter what their speed:

Conservation of momentum:

$$P = m \times v + (-m) \times v = [m + (-m)] \times v = 0 \times v = 0$$

Conservation of the kinetic energy:

$$E = m \times v^2 \times 1/2 + (-m) \times v^2 \times 1/2 = [m + (-m)] \times v^2 \times 1/2 = 0 \times v^2 \times 1/2 = 0$$

We have positive mass  $m$ , the anti-gravitons and the negative mass  $-m$ , the gravitons at Ferent wall.

Ferent matter contains the anti-gravitons. Positive mass has attractive effect on each other so it forms dark matter and matter at Planck wall.

This means Ferent matter at Planck wall was divided in dark matter and matter.

Because the Ferent matter, the positive mass can not have the speed of the gravitons, between the Ferent wall and the Planck wall the universe had a negative acceleration:

$$(c - v_a) / (t_P - t_F) = (-1.001762 \times 10^{17} \text{ m/s}) / 5.391 \times 10^{-44} \text{ s} = -1.858 \times 10^{60} \text{ m/s}^2.$$



The others gravity theories do not explain why the universe expanded and why the universe slowed down.

I discovered the graviton:

the impulse of the graviton, the energy of the graviton, the speed of the graviton, the frequency of the graviton and the mass of the graviton.

### **Dark energy**

The gravitons traveling between galaxies are dark energy. These gravitons repel each other.

The negative mass, the gravitons are the dark energy that accelerates in the direction of cosmic expansion.

Repulsion is required for cosmic expansion.

The even distribution of gravitons means that dark energy does not have any local gravitational effects, but rather a global effect on the universe as a whole.

### **Perturbation and interaction. LIGO, LISA**

Einstein's General Relativity theory is the perturbation of the gravitational field by the presence of an object, of a mass. That is why Einstein's General Relativity theory does not explain the gravitation, explains only an effect of gravitation.

In Einstein's General Relativity theory the gravitational force is not an interaction force, does not explain how the gravitons mediate the gravitational force.

That is why there are wrong projects like LIGO, LISA

LISA is a proposed European Space Agency mission designed to detect and accurately measure gravitational waves the small ripples of spacetime from astronomical sources. Gravitational wave astronomy seeks to use direct measurements of gravitational waves to study astrophysical systems and to test Einstein's theory of gravity.

In my view LIGO, LISA measures only a perturbation in the gravitational field, not the flux of gravitons (with a speed much bigger than the speed of light), the real gravitational wave, the interaction force.

Einstein's General Relativity theory is only the geometric theory of gravitation.

I realized that nobody understood in my theory the difference between perturbation and interaction! That is why there are developed wrong projects like LIGO, LISA...

The perturbation of a photon in the gravitational field is a graviton with the same frequency and speed as the photon has; but the gravitons in my theory that mediate the gravitational force, the gravitons which mediate the interaction force have different frequencies when the photon travels near an asteroid, near the Earth or near the Sun.

To understand this you have to understand the amplitude modulation of an electrical signal in electronics.

The amplitude (signal strength) of the carrier wave is varied in proportion to the waveform being transmitted.

In LIGO, LISA, Einstein General Relativity theory... waveform being transmitted is considered the carrier wave and that is a mistake.

## Ferent gravitational force function

Newton formulation of a gravitational force law requires that each particle with mass respond instantaneously to every other particle with mass irrespective of the distance between them; Newton's theory assumes the speed of gravity to be infinite.

Einstein applied his field equations to cosmology. He liked the idea of a static universe (one that neither expands nor contracts) but he found that his equations would not produce one. That is why he added a term to the curvature side of the equation called the cosmological constant, keeping the model static. This shows that Einstein like Newton did not understand the dynamical universe.

In 1922 Friedmann published a paper where he used Einstein's original equations without the cosmological constant term to show that the universe must be dynamical.

The gravitational force on a particle at a given location  $d$ , and time  $t$ , depends on the position of the source particles at an earlier time due to the finite speed of the gravitons.

Ferent gravitational force function is a convolution of two functions, the Newton (Hooke) law of universal gravitation function and Dirac delta function.

Newton (Hooke) law of universal gravitation:

$$F = G \frac{m_1 m_2}{r^2}$$

where:

F - the force between the masses

G - the gravitational constant

$m_1$  - the first mass;

$m_2$  - the second mass;

r - the distance between the centers of the masses

Dirac delta function can be thought of as a function on the real line which is zero everywhere except at the origin, where it is infinite.

The Dirac delta function can be rigorously defined either as a distribution or as a measure.

$$\delta(x) = \begin{cases} +\infty, & x = 0 \\ 0, & x \neq 0 \end{cases}$$

and which is also constrained to satisfy the identity

$$\int_{-\infty}^{\infty} \delta(x) dx = 1$$

Because Newton formulation of a gravitational force law is not right and Einstein, Hilbert General Relativity theory is limited to the speed of light, here is how I calculated the gravitational force:

Ferent gravitational force function:

$$F = \int_{-\infty}^{\infty} G \frac{m_1(t)m_2(t)}{r^2(t)} \delta\left(t - \frac{r(t)}{v(t)}\right) dt$$

where:

$m(t)$  – I considered the mass a function of time

$r(t)$  – the distance between the centers of the masses

$v(t)$  – the speed of the gravitons

Ferent gravitational force function:

$$F = \int_{-\infty}^{\infty} G \frac{m_1(t)m_2(t)}{r^2} \delta\left(t - \frac{r}{v}\right) dt$$

where:

$m(t)$  – I considered the mass a function of time

$r$  – the distance between the centers of the masses

$v$  – the speed of the gravitons

If the mass is not a function of time:

$$F = G \frac{m_1 m_2}{r^2} \int_{-\infty}^{\infty} \delta\left(t - \frac{r}{v}\right) dt$$

Because the speed of the gravitation is not infinite like Newton considered.

Newton's theory assumes that the speed of gravitons to be infinite, this implies a static model for the universe; this static model is presented today to the students.

### **Ferent electric force function**

Coulomb's law is requires infinite speed for the photons, but the speed of the photons is limited; it is the speed of light.

$$F = k_e \frac{q_1 q_2}{r^2}$$

where:

$F$  – the force between two point charges

$k_e$  – the Coulomb's constant  
 $q_1$  – the first charge  
 $q_2$  – the second charge  
 $r$  – the distance between the charges

Ferent electric force function is a convolution of two functions, the Coulomb's law and Dirac delta function.

$$F_e = \int_{-\infty}^{\infty} k_e \frac{q_1(t)q_2(t)}{r^2(t)} \delta\left(t - \frac{r(t)}{c(t)}\right) dt$$

where:

$q(t)$  – I considered the charges function of time  
 $r(t)$  – the distance between the charges  
 $c(t)$  – the speed of the photons

### The gravitational field

Describes gravitation as a physical force acting on the particles of matter. The matter, the gravitational field, as well as other fields change such properties of wave quanta as their propagation velocity and frequency of oscillations. Since the spacetime measurements are carried out by means of waves it follows that the observed geometrical properties of spacetime depend on the sources of energy-momentum in the form of matter and fields.

The expression  $c^2 dt^2 - dx^2 - dy^2 - dz^2$  is the interval (the spacetime distance)  $ds^2$  (in a reference frame) between the two infinitesimally close events on the worldline of a particle; the length of the worldline between these events is the proper time  $d\tau$ .

This means:

$$ds^2 = c^2 dt^2 - dx^2 - dy^2 - dz^2$$

Because Special relativity is incorrect, limited to the speed of light, this means the Minkowski spacetime is incorrect. That is why I replaced the speed of light  $c$  with the speed of the gravitons  $v_a$ .

The spacetime as four-dimensional coordinate system in Minkowski spacetime  $(x, y, z, ct)$  becomes  $(x, y, z, v_a t)$  and  $ds^2 = c^2 dt^2 - dx^2 - dy^2 - dz^2$  becomes  $ds^2 = v_a^2 dt^2 - dx^2 - dy^2 - dz^2$

$$\Gamma = -\nabla \psi - \frac{\partial D}{\partial t}$$

$$\Omega = \nabla \times D$$

$\Gamma$  is the gravitational field strength  
 $\Omega$  is the gravitational torsion field

The wave equation is directly derived from the basic equations of the field:

$$\nabla \cdot D + \frac{1}{v_a^2} \frac{\partial \psi}{\partial t} = 0$$

Equations in four-dimensional world

Scalar  $\psi$  and vector  $D$  potentials of gravitational field together form the gravitational four-potential:

$$D_i = \left( \frac{\psi}{v_a}, -D \right)$$

With the help of 4-vector  $D_i$  can be determined the antisymmetric gravitational tensor:

$$\Phi_{ik} = \partial_i D_k - \partial_k D_i$$

The components of this tensor are:

$$\Phi_{ik} = \begin{vmatrix} 0 & \frac{\Gamma_x}{v_a} & \frac{\Gamma_y}{v_a} & \frac{\Gamma_z}{v_a} \\ -\frac{\Gamma_x}{v_a} & 0 & -\Omega_z & \Omega_y \\ -\frac{\Gamma_y}{v_a} & \Omega_z & 0 & -\Omega_x \\ -\frac{\Gamma_z}{v_a} & -\Omega_y & \Omega_x & 0 \end{vmatrix}$$

With the help of the tensor  $\Phi_{ik}$  four vector equations of gravitational field are transformed into two tensor equations.

The covariant gravitational field equations have the form:

$$\nabla_n \Phi_{ik} + \nabla_i \Phi_{kn} + \nabla_k \Phi_{ni} = 0$$

$$\nabla_k \Phi^{ik} = \frac{4\pi G}{v_a^2} J_i$$

Where

$\Phi_{ik}$  is the gravitational tensor

$J_i = \rho_0 u^i$  is the mass 4-current (mass current density), which generates the gravitational field

$u^i = \frac{dx^i}{d\tau}$  is the 4-velocity of the matter unit in the curved spacetime

$dx^i$  is the 4-vector of displacement

$d\tau$  is the differential of proper time

$\rho_0$  is the mass density in the frame at rest relative to the matter

$G$  is the gravitational constant

$v_a$  is the speed of gravitation

The tensor  $\Phi_{ik}$  allows us to determine the gravitational stress-energy tensor:

$$U^{ik} = \frac{v_a^2}{4\pi G} \left( -g^{im} \Phi_{mr} \Phi^{rk} + \frac{1}{4} g^{ik} \Phi_{rm} \Phi^{mr} \right)$$

Where:

$$g^{ik} = \begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & 0 & 0 & -1 \end{pmatrix}$$

is the metric tensor

For a single particle in a gravitational field the Lagrangian has the form:

$$L = -mv_a \frac{ds}{dt} - m \frac{D_k dx^k}{dt} + \frac{v_a}{16\pi G} \int \Phi_{ik} \Phi^{ik} \frac{dx^4}{dt}$$

where

$ds$  – invariant interval

$dx^k$  – 4-vector of particle displacement

### The gravitational field equation $g(\mathbf{r},t)$

The gravitational force  $F = Mg$

The gravitational field equation is:

$$g = -\nabla \psi - \frac{\partial D}{\partial t}$$

$\psi$  - scalar potential of gravitational field

$D$  - vector potential of gravitational field

The Liénard–Wiechert potentials describe the classical electromagnetic effect of a moving electric point charge in terms of a vector potential and a scalar potential. These

potentials describe the complete, relativistically correct, time-varying electromagnetic field for a point charge in arbitrary motion, but are not corrected for quantum mechanical effects.

I used these potentials which describe the classical electromagnetic effect of a moving electric point charge, as potentials which describe the classical gravitational effect of a moving mass and to calculate the gravitational field equation.

The retarded time  $t_r$ :

$$t_r = t - \frac{|r - r_s|}{v_a}$$

The scalar potential of gravitational field:

$$\psi(r, t) = G \left( \frac{m}{(1 - n\beta)|r - r_s|} \right)_{t_r}$$

where:

$$\beta(t) = \frac{v_s(t)}{v_a} \text{ and } n(t) = \frac{r - r_s(t)}{|r - r_s(t)|}$$

where:

$v_a$  – the speed of the gravitons

$v_s$  – the speed of the mass  $m$

$r_s$  – the position of the mass  $m$

The vector potential of gravitational field:

$$D(r, t) = \frac{\beta(t_r)}{v_a} \psi(r, t)$$

The gravitational field equation is:

$$g(r, t) = G \left( \frac{m(n - \beta)}{\gamma^2 (1 - n\beta)^3 |r - r_s|^2} + \frac{mn \times ((n - \beta) \times \dot{\beta})}{v_a (1 - n\beta)^3 |r - r_s|} \right)_{t_r}$$

where:

$$\gamma(t) = \frac{1}{\sqrt{1 - |\beta(t)|^2}}$$

The  $(n - \beta)$  is part of the first term updates the direction of the field toward the instantaneous position of the mass  $m$ , if it continues to move with constant velocity. This term is connected with the ‘static’ part of the gravitational field of the mass  $m$ .

The second term, which is connected with gravitational radiation by the moving mass  $m$ , requires mass acceleration.

## 7. Quantization of the gravitational field

The gravitational field consists of discrete energy quantity, the gravitons.

The problem with quantum gravity is that quantum gravitational effects are only expected to become apparent near the Planck scale, a scale far smaller in distance and equivalently far larger in energy than what is currently accessible at high energy particle accelerators.

That is why quantum gravity is a mainly theoretical project.

At present, one of the deepest problems in theoretical physics is harmonizing the theory of general relativity, which describes gravitation, and applications to large-scale structures (stars, planets, galaxies), with quantum mechanics, which describes the other three fundamental forces acting on the atomic scale.

I explained Gravitation with quantum mechanics; this means all four fundamental forces acting on the atomic scale are described with quantum mechanics.

Gravitons are massless particles of definite energy and definite momentum.

The gravitational field consists of discrete energy quantity  $av$ , where  $a$  is Ferent's constant and  $v$  is the frequency of the graviton.

A quantum mechanical graviton state  $|k, \mu\rangle$  belonging to mode  $(k, \mu)$  has the following properties:

$$m_{\text{graviton}} = 0$$

$$H|k, \mu\rangle = av|k, \mu\rangle \text{ with } v = v_a|k|$$

$k$  - the wave vector

$\mu$  - the spin of the graviton

The single-graviton state is an eigenstate of the momentum operator, and  $\underline{ak}$  is the eigenvalue (the momentum of a single graviton).

$$P|k, \mu\rangle = \underline{ak}|k, \mu\rangle$$

These equations say respectively: a graviton has zero rest mass; the graviton energy is  $hv = av_a|k|$  ( $k$  is the wave vector,  $v_a$  is speed of graviton) and its gravitation momentum is  $\underline{ak}$ .

The gravitational field equation is:

$$g = -\nabla \psi - \frac{\partial D}{\partial t}$$

$\psi$  - scalar potential of gravitational field

$D$  - vector potential of gravitational field

The field equations contain only derivatives of the field. Their plane wave solution has the form:



$$\Psi = \text{Re}\{D e^{i(kx - \omega t)}\}$$

where:

$k$  – wave vector related to the frequency  $\omega$

The momentum operator:

$$\hat{p}_x = -i\hbar \frac{\partial}{\partial x}$$

$$\hat{p} = -i\hbar \nabla$$

The energy operator:

$$\hat{E} = i\hbar \frac{\partial}{\partial t}$$

Eigen wave function of the graviton:

$$i\hbar \frac{\partial}{\partial t} |\Psi\rangle = E |\Psi\rangle$$

$\Psi$  – the wave function of the graviton

With the Hamiltonian operator:

$$\hat{H} |\Psi\rangle = E |\Psi\rangle$$

### Interactions of gravitational fields with matter

Coupling of the quantized gravitational field to nonrelativistic charges is considered.

The interaction is to modify the four-momentum of the particle of mass  $m$ :

The momentum  $p$  becomes  $p - \frac{m}{v_a} D$

The energy  $E$  becomes  $E - mA$

Where  $A$  is the scalar gravitational potential and  $D$  is the vector gravitational potential.

The energy operator is  $E = i\hbar \frac{\partial}{\partial t}$  and the momentum operator is  $p = -i\hbar \nabla$ .

Schrödinger equation:

$$\left[ \frac{p^2}{2m} + V(r) \right] \Psi(r,t) = i\hbar \frac{\partial}{\partial t} \Psi(r,t)$$

The interaction with the gravitational field:

$$\left[ \frac{(p - \frac{m}{v_a} D)^2}{2m} + V(r) + mA \right] \Psi(r,t) = i\hbar \frac{\partial}{\partial t} \Psi(r,t)$$

Then the Hamiltonian:

$$H = \left[ \frac{(p - \frac{m}{v_a} D)^2}{2m} + V(r) + mA \right]$$

Fermi's golden rule is a simple formula for the constant transition rate (probability of transition per unit time) from one energy eigenstate of a quantum system into other energy eigenstates in a continuum, affected by a perturbation.

$$\omega_{I \rightarrow F} = \frac{2\pi}{\hbar} \left| \langle \Psi_F | H_1 | \Psi_I \rangle \right|^2 \rho$$

In first order time-dependent perturbation theory, if an effective potential that is acting is  $V(t) = V_0 e^{-i\omega t} + V_0^\dagger e^{+i\omega t}$ , the transition amplitude according to the Born approximation is:

$$\langle f | U(t_0) | i \rangle = \frac{-i}{\hbar} \int_0^t d\tau e^{i\omega_f \tau} \langle f | V(\tau) | i \rangle$$

**The absorption of a graviton and the emission of a graviton:**

The frequency depends on the difference in energy of the initial and final states of the matter.

$$\omega_f = \frac{E_f - E_i}{\hbar}$$

Formal function for the absorption of a graviton:

$$\int_0^t d\tau e^{i \frac{E_f - E_i}{\hbar} \tau} e^{-i\omega_k \tau} = \frac{e^{i(\frac{E_f - E_i}{\hbar} - \omega_k)t} - 1}{i(\frac{E_f - E_i}{\hbar} - \omega_k)}$$

Ferent function for the emission of a graviton:

$$\int_0^t d\tau e^{i\frac{E_f - E_i}{\underline{a}}\tau} e^{+i\omega_k \tau} = \frac{e^{i(\frac{E_f - E_i}{\underline{a}} + \omega_k)t} - 1}{i(\frac{E_f - E_i}{\underline{a}} + \omega_k)}$$

### Graviton energy

The harmonic oscillator Hamiltonian has the form:

$$H = \hbar\omega(a^\dagger a + \frac{1}{2})$$

$\omega \equiv 2\pi\nu$  is the fundamental frequency of the oscillator. The ground state of the oscillator is  $|0\rangle$  and is referred to as vacuum state. It can be shown that  $a^\dagger$  is a creation operator, it excites from an n fold excited state to an n+1 fold excited state:

$$a^\dagger |n\rangle = |n+1\rangle \sqrt{n+1}$$

The annihilation operator:

$$a |n\rangle = |n-1\rangle \sqrt{n}$$

We have a number of non-interacting one-dimensional harmonic oscillators:

$$H = \sum_i \hbar\omega_i (a^\dagger(i)a(i) + \frac{1}{2})$$

With the substitution:

$$i \rightarrow (k, \mu)$$

The Hamiltonian of the Gravitational field can be looked upon as a Hamiltonian of independent oscillators of energy  $\omega = k|v_a$  and oscillating along direction  $e^\mu$

$$H = \sum_{k, \mu} \underline{a}\omega (a^{\dagger(\mu)}(k)a^{(\mu)}(k) + \frac{1}{2})$$

The effect of H on a single graviton state  $H|k, \mu\rangle$

$$H(a^{\dagger(\mu)}(k)|0\rangle) = \underline{a}\omega (a^{\dagger(\mu)}(k)|0\rangle) = \underline{a}\omega |k, \mu\rangle$$

The single graviton state is an eigenstate of H and the corresponding energy is  $\underline{a}\omega$ .

### **Proof for my theory**

When people saw the same constellations for years, they were supposed to understand that the gravitons with the speed of light are too slow to keep those stars together. That is why Einstein-Hilbert gravitational field equations, String theory, LQG... are limited, because are limited to the speed of light.

A graviton or a virtual graviton needs less then one second to travel between stars located within 10 light-years.

A light year value is  $ly = 9.460536207 \times 10^{15}$  m, the speed of the graviton  $v_a = 1.001762 \times 10^{17}$  m/s and  $t = 10 \times ly / v_a$ , this means  $t < 1s$ .

### **Another proof for my theory**

There are galaxies 11 billion light years away, which are receding from us.

Why?

Because in my view the speed of the graviton  $v_a$  is too small to keep the galaxies together.

### **Another proof for my theory**

At the event horizon of the black hole from our galaxy the Gravity = 0, because the escape velocity is greater than  $c$  - speed of light and by Einstein gravitation theory, String theory, LQG...the gravitons have the speed of light. This means the black hole do not attract anything.

I am the first in the world who realized that the gravitons with the speed of light will not escape a black hole. This means if the (gravitation) gravitons have the speed of light like Einstein field equations confirm, the black holes will not attract anything.

For a non-rotating spherically symmetric massive body such as a star or a planet the escape velocity at a given distance  $r$ , is calculated by the formula:

$$v = \sqrt{\frac{2GM}{r}}$$

where:

$G$  is the universal gravitational constant

$M$  is the mass of the object

$r$  is the distance from the point in space to its center mass

The Schwarzschild radius:

$$r_s = \frac{2GM}{c^2}$$

where:

$r_s$  is the Schwarzschild radius

$M$  is the mass of the object

$c$  is the speed of light

If I will replace  $r$  with  $r_s$  in the escape velocity formula, I will obtain:

$$v = c$$

This means the escape velocity for a black hole is greater than  $c$  - the speed of light and this shows that my gravitation theory is right and Einstein gravitation theory is incorrect.

The black holes will attract stars and planets only if the (gravitation) gravitons have a speed much higher than the speed of light.

I calculated the speed of the (gravitation) gravitons  $v = 1.001762 \times 10^{17}$  m/s.

“I am the first who understood and explained the Gravitation with high speed gravitons  $v = 1.001762 \times 10^{17}$  m/s, with Negative Impulse, Negative Mass and Negative Energy”

Adrian Ferent

Each of my theory, Evolution theory and Science and Spirituality theory contains couple of my quotations.

Here there are few of my quotations related to my Gravitation theory:

## Ferent Quotations

“My Nobel Prize - Discovery: the Photon – Graviton pair (coupled) has the same speed and frequency, and the photon energy divided by the graviton energy is the electromagnetic energy divided by the gravitational energy, the electromagnetic force divided by the gravitational force”

“Ferent equation for the energy of a photon  $E = h \times f + a \times f$ ”

“In Ferent electromagnetic theory, gravity does collapse quantum superpositions, gravity bend light because light has 3 sinusoids, has a gravitational sinusoid!

In Maxwell electromagnetic theory, gravity does not collapse quantum superpositions, gravity does not bend light, because light has only 2 sinusoids!”

“Two important walls:

The Ferent wall: here at time  $t = 1.294 \times 10^{-86}$  s were created Ferent matter and Gravitons, with the speed of the gravitons  $v = 1.001762 \times 10^{17}$  m/s.

The Planck wall: here at time  $t = 5.391 \times 10^{-44}$  s were created Matter and Photons, with the speed of the photons  $c = 2.99792458 \times 10^8$  m/s”

“Ferent matter is matter with the density less than or equal to Ferent density and greater than Planck density”

“In the beginning was the qubit”

“I am the first in the world who Understood and Explained the Gravitation with high speed gravitons,  $v = 1.001762 \times 10^{17}$  m/s”

“Lorentz, Poincaré, Einstein’s Special relativity is incorrect because is limited to the speed of light and to the photon energy”

“During the Big Bang first emerged the gravitational force with the speed of the gravitons:  $v = 1.001762 \times 10^{17} \text{ m / s}$ ”

“Gravitons with the speed of light,  $c = 2.9979 \times 10^8 \text{ m/s}$ , are too Slow to keep the galaxy together”

“The majority of Ferent matter is the core of the supermassive black hole, in the center of each galaxy”

“How light can’t escape from inside event horizon of Black holes, in the same way the gravitons with the speed of light  $c = 2.9979 \times 10^8 \text{ m/s}$  can't escape from inside the event horizon. Only high speed gravitons,  $v = 1.001762 \times 10^{17} \text{ m/s}$ , can escape from inside the event horizon of Black holes and keep the galaxy together”

“The properties of Ferent matter are the properties of dark matter”

“Einstein, Hilbert General Relativity theory, String theory, LQG, all Quantum gravity theories are incorrect because are limited to the speed of light”

“Science will begin only when the scientists will understand the Gravitation”

“When the electron is jiggled it is a change in the gravitational field and the gravitons with a speed faster than the speed of light,  $v = 1.001762 \times 10^{17} \text{ m / s}$  will change the state of the entangled electron”

“It is not possible to have a Big Bounce from the Planck scale”

“The energy E contained in a graviton, which represents the smallest possible 'packet' of energy in an gravitational wave is ‘a’ the Ferent constant times frequency  $E = a \times f$ ”

"In the beginning was the gravitation"

“I am the first who understood and explained the Gravitation with high speed gravitons  $v = 1.001762 \times 10^{17} \text{ m/s}$ , with Negative Impulse, Negative Mass and Negative Energy”

“First try to understand gravitation and after do the calculations. If not you will follow Einstein and Hilbert who explained gravitation with geometry”

“The Photon – Graviton pair (coupled) has the same speed and frequency and this means the light has gravitation”

“Decoherence explained: the electromagnetic wave is the superposition of 3 sinusoids; this means the electromagnetic wave will be collapsed by the presence of an electric field, of a magnetic field, of a gravitational field, another electromagnetic wave...”

“When people saw the same constellations for years, they were supposed to understand that the gravitons with the speed of light are too slow to keep those stars together. That is why Einstein-Hilbert gravitational field equations are wrong, because they are limited to the speed of light”

“All the scientists followed the Einstein-Hilbert equations looking for big gravitational waves created by binary star systems and they built very expensive gravitational wave detectors. I was looking for a wave created by a single graviton”

“There are galaxies 11 billion light years away, which are receding from us, because the speed of the graviton  $v = 1.001762 \times 10^{17}$  m / s is too small to keep the galaxies together”

## 8. Conclusions

I consider the theory of gravity the most important theory because since ancient times the brightest people tried to explain the most common force in nature and how the universe began.

I discovered the graviton: the impulse of the graviton, the energy of the graviton, the speed of the graviton, the frequency of the graviton and the mass of the graviton.

I found another wall the Ferent wall beyond the Planck wall, where the Planck constant  $h = 6.62606957 \times 10^{-34}$  J·s is replaced by Ferent constant  $a = 1.590511178 \times 10^{-76}$  J·s.

I replaced Max Planck equation  $E = h \times f$  with the Ferent equation for the energy of a photon:

$$E = h \times f + a \times f$$

I discovered the impulse of the graviton:

$$p = a / \lambda$$

I replaced Heisenberg Uncertainty Principle  $\Delta p \times \Delta x \geq h / 4\pi$  with Ferent Uncertainty Principle:

$$\Delta p \times \Delta x \geq a$$

I discovered a new gravitation theory and I found how the gravitation and the gravitons emerged at first Ferent wall. Here the gravitons have the speed equal with the speed of light.

Why gravitons faster than the speed of light?

I am the first in the world who understood and explained that the gravitons with the speed of light are too slow to keep the constellations together. The gravitons with the speed of light are too slow for the escape velocity of a black hole.

During the Big Bang first emerged the gravitational force with the speed of the gravitons:

$$v_a = 1.0017620 \times 10^{17} \text{ m/s}$$

These gravitons with the speed much bigger than the speed of light at the second Ferent wall have negative impulse, negative mass and negative energy.

I explained why the universe slowed down with a negative acceleration  $- 1.858 \times 10^{60}$  m/s<sup>2</sup> between Ferent wall and Planck wall, because Ferent matter has positive mass and I

explained why the universe expanded  $1.546 \times 10^{85}$  times, because the gravitons have negative mass.

The others gravity theories do not explain why the universe expanded and why the universe slowed down.

Between Ferent wall and Planck wall the universe expanded  $V_P / V_F = 1.546 \times 10^{85}$  times in a period  $t = t_P - t_F = 5.391 \times 10^{-44}$  s.

Because the Ferent matter, the positive mass can not have the speed of the gravitons, between the Ferent wall and the Planck wall the universe had a negative acceleration:

$$(c - v_a) / (t_P - t_F) = - 1.858 \times 10^{60} \text{ m/s}^2.$$

At Planck wall emerged the electromagnetic force, the strong nuclear force and the weak nuclear force.

I discovered a new electromagnetic theory.

The gravitons with high speed keep our galaxy together.

When people saw the same constellations for years, they were supposed to understand that the gravitons with the speed of light are too slow to keep those stars together. That is why Einstein-Hilbert gravitational field equations, String theory, LQG... are limited, because are limited to the speed of light.

My gravitation theory explains dark matter and dark energy.

Ferent gravitational force function is a convolution of two functions, the Newton (Hooke) law of universal gravitation function and Dirac delta function.

Ferent gravitational force function:

$$F = \int_{-\infty}^{\infty} G \frac{m_1(t)m_2(t)}{r^2(t)} \delta\left(t - \frac{r(t)}{v(t)}\right) dt$$

I explained quantum entanglement and decoherence.

The perturbation of a photon in the gravitational field is a graviton with the same frequency and speed as the photon has; but the gravitons in my theory that mediates the gravitational force, the gravitons which mediates the interaction force have different frequencies when the photon travels near an asteroid, near the Earth or near the Sun.

Ferent electric force function:

$$F_e = \int_{-\infty}^{\infty} k_e \frac{q_1(t)q_2(t)}{r^2(t)} \delta\left(t - \frac{r(t)}{c(t)}\right) dt$$

A lot of gravity theories explain that the universe was very hot this means electromagnetic radiation, beyond the Planck wall. My theory explains that beyond the Planck wall was only Ferent matter and gravitons.

My quantum gravity theory shows that the gravitons are too small to be detected by today's technology.