The physics paradoxes and the time of the particles.

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The Step−by−Step QTG:

This is a presentation of the QTG without the use of mathematics or diagrams, using a logical sequence of information together with mental experiments, arguments, considerations and conclusions to give a simpler understanding of the ideas and philosophy of the QTG.

1. The starting point for a better understanding of the QTG depends on accepting that the speed of light is the same for any point of reference, and that it is also the highest speed that any kind of information can reach. These are structural characteristics of our space−time: the natural laws of our universe.

2. It is also essential to accept the dilation of time and all the other consequences of Step 1, as established by the theories of Special and General Relativity.

3. We will begin with a mental experiment, in which Anna, Tim and Bob are sitting equally spaced around a round table. There is perfect symmetry between them.

4. In this situation, we can see that each of them will have an imperceptibly different reality in relation to the present, as a consequence of the limit to the speed of information.

5. We should consider that we are analyzing macrostructures or objects in the macrocosm, because Anna, Tim and Bob are made up of a very large number of atoms.

6. We know that all of the photons perceived by their eyes had an origin, that is, they were dispersed by atoms, and these atoms do this constantly. Photons do not come from nothing.

7. Electromagnetic waves are photons that oscillate at all frequencies, but we perceive only a small portion of this spectrum.

8. The collapse of these photons also occurs in atoms: the spectrum perceived by the eye transmits the information via an electrical signal

along the optic nerve.

9. We must accept that the optic nerve is the point of reference of each observer: the entry point for the electromagnetic waves.

10. Considering Step 1, we know that all information received by the optic nerve is from the past. That is, for Anna, Tim and Bob, all information analyzed is from the past. They are three different observation systems, each with the sensation of being in the future. This is true for each of them, and is what we referred to in Step 4.

11. While we were philosophizing, time was passing: the main time related to the time reference of these macrostructures. In a way, we could admit that time passes at the same rate for each of them, as they are practically within the same point of reference. We will name the velocity at which this time advances the local time reference.

12. Let us now imagine that at the center of our round table is a hydrogen atom, at exactly the same distance from the three optic nerves of Anna, Tim and Bob.

13. As this atoms consists of subatomic particles, we classify it as being a microstructure or a microcosm.

14. For this hydrogen atom, Anna, Tim and Bob are equally in the past by exactly the same amount, because information from them reaches its nucleus simultaneously. We should imagine this as an ideal central point.

15. Even though they are within the same local time reference, Anna, Tim and Bob are in the past for the hydrogen atom. Analyzing the passage of time, including the hydrogen atom, it can be seen that the time of the four objects passes at the same rate, according to the local time reference.

16. This hydrogen atom has one electron in its electron cloud. According to quantum mechanics, there is a probability of around 90% that the electron will be found at a distance equal to Bohr's radius.

17. By convention, the electron has a negative charge and the proton in the nucleus has a positive charge. Between these charges there is a centripetal Coulomb force from the point of reference of the electron.

18. This negatively−charged electron has a given rotation around the nucleus, necessary to keep it away from the positively−charged nucleus. This centrifugal force counters the centripetal force.

19. We are aware of using the atomic model from the old quantum theory. This was motivated partly by the abstract language of quantum mechanics, and chiefly by the need for a way of visualizing the

process, which would otherwise be impossible.

20. The old quantum theory, by means of significantly simpler mathematical processes, can give certain numerically correct results, chiefly for the hydrogen atom, thus allowing a more accessible physical interpretation.

21. We can establish the idea of direction for time if we consider that time passes more slowly in the electron cloud, as a result of the time dilation described by Special Relativity for objects at speeds close to the speed of light. One of the properties of atoms is thus to polarize the time of the nucleus towards the future, thus standardizing a direction for time.

22. At a given instant, with Anna, Tim and Bob in the condition of observation systems for this hydrogen atom, the electron of this atom is located at a different distance from each one.

23. We should bear in mind that any observation system will consist of a large number of atoms and that these will have their own respective nuclei and electron clouds. These atoms also define their own local time reference, through the temporal identification of their nuclei.

24. The geometric center of the nucleus has the greatest concentration of mass (with densities around 1018 kg/m3). Experimentally, it has been shown that protons and neutrons concentrate a great deal of mass in a small spherical volume (measured in cubic Fm, or 10−15m3).

25. Bearing in mind steps 22, 23 and 24, it can be seen that the electron has a temporal behavior with wave characteristics, a temporal wave that is different for each observation system (Anna, Tim and Bob, in this case). This wave oscillates between a near past and a near future, progressing around the local time reference.

26. The observation systems are distributed in 3−dimensional space, and the wave, when projected in 2 dimensions, has a sine form around the local time reference. Imagined in space, it forms a helix.

27. According to Louis de Broglie, both matter and radiation have a wave behavior. The total energy is related to a given frequency or temporal oscillation.

28. The sum of this infinite number of waves (considering an infinite number of observation systems) is the matter wave that defines an electron or the electromagnetic wave that defines a photon, as shown by quantum mechanics. These are the waves of the new quantum theory.

29. For each observation systems, there is a different wave, and it is this that results in the uncertainty principle. Each observation system perceives a different temporal reality for the same event. Under the

QTG, this reveals the temporal uncertainty principle.

30. All of quantum theory is based on the uncertainty principle, while the QTG replaces it with the temporal uncertainty principle. This in no way invalidates the powerful mathematical structure of quantum mechanics.

31. In the QTG, the introduction of the temporal uncertainty principle aims to describe physical reality at a deeper level, to counter the merely statistical interpretations of quantum mechanics and to show that the variables that are hidden from us are, in fact, only undefined in time, between a near past and a near future.

32. We therefore conclude that the temporal wave of this electron is none other than the waveform manifestation of its temporal behavior, in relation to the local time of the surrounding macrostructure.

33. So far, we have only analyzed the electron while it is associated with the hydrogen atom. Once dispersed, this electron will continue to exhibit wave behavior, because it will continue to have different temporal information for each observation system.

34. This dispersed electron acquired its wave characteristics in its atom of origin, while orbiting the nucleus, as determined by its quantum numbers. Now, however, the electron no longer oscillates around the nucleus, but around the local time reference.

35. Considering that this electron, when in the atom, was temporally dependent on the entire macrostructure surrounding it, its dispersed behavior should have a certain coherence with this macrostructural interference, and this is why its temporal indefinition persists.

36. For this dispersed electron, its reference is no longer its nucleus, but the nuclei of all the atoms or microcosms that make up the surrounding macrostructure.

37. Experimentally, it can be seen that atoms are stable. That is, these electrons do not emit electromagnetic radiation when within the atoms, even under acceleration. Their energy thus remains constant.

38. Within atoms, the electrical charges are neutralized, which is not the case when an electron is dispersed in the macrocosm, but it is not known why electromagnetism only occurs in the macrocosm.

39. As the nucleus is identified with the local time reference or present, while the electron is constantly out of phase with it, we can see that the electron does not radiate energy beyond the atom while associated with the nucleus, because its temporal identification with the macrocosm beyond the atom is through that same nucleus.

40. To date, no reasonable physical explanation exists for the

functioning of the atom. Here, I refer to the continuous and persistent motion of these electrons around the nucleus. The electrons are attracted to the nucleus, but it is not known why they do not spiral into it.

41. On the one hand, the QTG attributes this impossibility of the electrons being intercepted by the nucleus to the particles' lack of temporal definition. On the other hand, the QTG states that it is the continuous, uninterrupted motion of the particles' is the result of their search for temporal equilibrium in relation to the local time reference.

42. We know that, depending on the point of reference of the observer, there is an asymmetry in electromagnetic phenomena.

43. In order to understand this, let us imagine a perfectly isolating rod, with a metallic sphere at each end, one positively−charged (lacking electrons) and one negatively−charged (with an excess of electrons).

44. By means of a cable attached to the middle of the rod, a spaceship pull this system at constant velocity through completely empty interstellar space.

45. An observer at a point of reference in the spaceship perceives only a Coulomb force attracting the two spheres.

46. Another observer, at a stationary point of reference at a certain distance from where the spaceship passes, perceives not only the Coulomb force, but also forces of electromagnetic origin resulting from the relative motion of the electric charges.

47. We can therefore conclude that two equal and opposite electric charges, separated by a given distance and in constant parallel motion, will experience different attractive forces according to observers at different points of reference.

48. If we analyze the hydrogen atom and compare the electron−proton pair with the rod seen in Steps 42 to 47, we can see that, if the proton were fixed or static in some ideally centralized location in the nucleus (as in Step 14), no external observer would perceive these forces of electromagnetic origin.

49. However, we know that this ideal situation is not an exact representation of reality, as we must take into account the oscillation of the proton around its local time reference, resulting from the necessity that any particle experiences of constantly identifying itself with the present. As seen in Steps 22 to 26, the location of this present time is very relative.

50. In order to understand the motion that the protons must undergo in

order to reach equilibrium with the present, we should perform a mental experiment, imagining two protons connected by an imaginary cable in a hypothetical empty space, monitored by n observation systems, equally spaced around them.

51. We should consider that that it is easier for paired particles to achieve temporal symmetry. This can be observed experimentally for electrons, protons and neutrons in atoms, which is why the most stable atoms are those with the famed magic numbers of pairs.

52. We know that the theory of nuclear shells provides that the protons and neutrons in an atomic nucleus will be paired, with a total spin of zero (spin (+½h) + spin (−½h) = 0). This is because, according to the Pauli exclusion principle that governs the orbital structure, these two protons or neutrons cannot have all of their four quantum numbers equal.

53. We know that the first three quantum numbers are needed to describe the location in three−dimensional space or the spatial coordinates, while the fourth is needed to describe temporal orientation.

54. When these protons are observed from any angle in three dimensions, the same point of equilibrium can always be found between the spheres for any given observer.

55. Any observation system will always perceive two protons, with the differences found to be restricted to the distances between them. We exclude the case of the observers that, due to the eclipse of one of the protons, observe a single proton, because here we have the same equilibrium found in the ideal case of a single proton.

56. The point of equilibrium will be the average of the times taken by a hypothetical signal to cover the distance from the protons to any observer equidistant from the observed system, as was seen for the atom in Steps 22 to 26.

57. On the other hand, if we add a third proton (or any odd number of protons), a three−dimensional analysis will never give a point of temporal equilibrium, excluding the two cases in which the system of three spheres is directly in line with the observation system.

58. It is easier to understand this temporal equilibrium experiment if we imagine a complete external observation system, which defines the local time carrier and imposes this local present on the pair of spheres.

59. It is for this reason that atomic nuclei that contain an even number of protons and neutrons result in more stable structures, as they have better temporal symmetry.

60. Considering that this proton is not ideally at rest, we can now

verify the effect of the rod (as seen in Steps 42 to 49) for any observer external to this atom or microcosm.

61. We can affirm that there are forces of electromagnetic origin, found in the atoms, that are relative and dependent on the point of reference of the external observer. That is, the same atom will theoretically present each observer with a different set of force vectors.

62. The perception of these forces by observers external to the atom depends directly on the velocity and angle of the electrical charges in motion. In the case of an atom, we know that the electron in the electron cloud has a velocity far greater than that of the proton in the nucleus.

63. The electron generates a greater electromagnetic field because of its greater velocity, and induces a far greater force in the proton. The asymmetry of these forces is relative, as shown previously, because it is only perceived by observers external to this microsystem.

64. Bearing in mind what we have seen in Steps 42 to 47, we should remember that the electromagnetic attractive force between these opposite charges will not be direct, as would be the case with charges of the same polarity. The resultant force vector of the electron should take into account the Coulomb force of attraction, which acts directly along the line that joins the two charges.

65. Einstein established the equivalence between the forces of gravity and inertia, but was unable to explain natural gravity, that is, the difference between inertia (artificial gravity) and natural gravity.

66. Given that it is possible to generate inertia or gravity artificially, and this implies that gravity or natural inertia also has an origin.

67. We know that inertia is the result of the application of a force on a mass, but we could also say that inertia is the property that a mass has when resisting a force.

68. It has been shown, both theoretically and experimentally, that the intensity of gravity (or natural inertia) influences the velocity of the passage of time or interferes with the rate at which time advances. This affects all processes, biological, chemical and especially physical.

69. Given that gravity has such an influence on time, or on the passage of time, it seems plausible that it has some co−participation in the actual existence of time, because when one thing manages to affect another in this way, we have good reason to suspect some form of complicity.

70. We could consider atoms as clocks that measure the passage of time with great efficiency, because they maintain the constant and uninterrupted oscillation of the electrons within them.

71. When an atom is within a gravitational field, this field has a direct influence on the rate of electron oscillation.

72. We know that atoms are stable, regardless of the intensity of the gravity they experience. That is, the internal forces of the atom must adapt themselves to every location, such that the atomic microsystem remains stable.

73. Let us imagine a truly minimal universe consisting of a single hydrogen atom.

74. In this minimal universe, there will be no gravitational influence external to the atom. If any gravity exists, it will only be that of the atom itself.

75. In this universe, as seen in Steps 42 to 50, there will be no external observer to detect any asymmetry of electromagnetic origin, and there will thus be a perfect equilibrium between the forces related to the atom's electrical charges.

76. Being without an external observation system, this universe will have no point of reference. This means there is no privileged location to be the present.

77. The electron, due to its lack of temporal indefinition, will have no reason to oscillate around the proton, because this particle will not necessarily represent the present. This universe will end up collapsing.

78. An electron in an atomic orbit is therefore influenced by the gravity of the location (as shown in Steps 69 to 71) to move in a different manner, so as to adjust itself to the local flow of time, or to move within the flow of time, modulated by the local gravity.

79. The macrocosm therefore establishes an induction on the flow of the time of the atom, resulting in its relative stability. The entire macrostructure around the atom is thus involved in the equilibrium of its electrons.

80. We know that the stability of an atom depends directly on the equilibrium of its internal forces. The electrons should experience a centripetal Coulomb force exactly equal to the centrifugal force in order to have atomic stability (see Steps 17 and 18).

81. In an atom, we have masses in motion and subject to the postulates of special relativity, due to their relative velocities.

82. The atom's electron is subject to special relativity, as a result of its velocity, in addition to being subject to general relativity, as a result of its centrifugal force (see Step 18).

83. On the one hand, if we take into account the postulates of special and general relativity in calculating the atomic forces, we see that the atom is in perfect equilibrium, because the Coulomb force is exactly equal to the centrifugal force.

84. On the other hand, if we include the problem of the lack of symmetry in the electromagnetic phenomena into the calculations of these forces, we will in fact find a small disequilibrium.

85. The electron, in its point of reference, must make up for this difference in the forces in order to maintain atomic stability. For this to happen, its orbital velocity must be reduced or increased. This velocity must, in some way, be modulated by space−time.

86. As the macrocosmic time reference resides in the nucleus and it is through the nucleus that the atom identifies itself with the local time reference, this difference in the forces is only perceived by observers external to the atom, or by the macrocosm.

87. This residual is gravity or natural inertia, which is only perceived by objects in the macrocosm.

88. We can conclude that this perception of a force without mass − gravity − is an energy of electromagnetic origin, which, because it has the macrocosm as its point of reference, is converted into gravitational energy as a result of this relative time reference and is transmitted to the macrocosm through the atomic nuclei.

89. Given that the electrical charges of the atoms are neutralized, these electrons, being in an equilibrium established by the macrocosm, do not radiate electromagnetic waves beyond the microsystem.

90. Electromagnetism, which theoretically exists within atoms, is not manifested externally, because this electromagnetic energy is seen in the macrocosm in the form of gravitational energy, which is a consequence of the relative time reference imposed by the macrocosm itself.

91. It is important to remember that the gravitational force obeys the inverse square law of distance, as does the Coulomb force. In fact, gravity acquires this characteristic at this origin, in addition to possessing the same velocity as electromagnetic waves.

92. We can therefore say that the gravitational field is formed by the inertia vectors generated by the electron shadows, when these forces are referenced to the atomic nuclei.

93. These vectors are a relativistic residual of the forces that reach equilibrium after the neutralization of the electrical charges, a force without mass, perceived only outside the atom.

94. We can also affirm that the gravitational field thus generated, as described by the QTG, has the same characteristics as the classical gravitational field. In one, the mass of the object is responsible, while in the other (the QTG), it is the electrons of the atoms of that object that are responsible. The result is equivalent, or the principle of equivalence itself.

95. The natural tendency of any massive particle is to identify itself with present time, as seen in Step 37, but this present time is defined by the sum of the atoms at that location.

96. A dispersed electron will be subject to the conditions of space−time, and will therefore exhibit wave characteristics, modulated by space−time or by the entire system responsible for generating gravity around it, the macrocosm.

97. This dispersed electron will now attempt to identify itself with the local time reference of this macrocosm. The macrocosm thus influences the behavior of the electron, as indeed the electron influences the macrocosm.

98. This is where we have the electromagnetic waves that radiate energy. Because the electron is no longer in tune with a single point of reference, but with the entire macrocosm around it, and which can now perceive it.

99. This is why only dispersed electrons can generate electromagnetic fields in the macrocosm, because the macrocosm itself becomes the point of reference. These electrons are no longer part of the formation of space−time and no longer contribute to the generation of gravity. Just as this electron took part, indirectly, in the generation of the vectors of natural inertia or gravity that gave consistency to space−time, so now, in its dispersed state, it is subject to the consequences of the space−time that it no longer sustains.

100. We can now understand why the energy of the electron, which was formerly gravitational, is transformed into electromagnetic form once dispersed.

Have a nice day,
Rolf

In the Quantum Theory of Gravity − "QTG" we will demonstrate how the gravity can be found in atoms and the importance of time.

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