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Space-time and CPH theory

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Abstract:

It has been more than a century since a geometric and integrated description of space and time under the title of space-time entered physics. Although the predictions of the geometrical approach to gravity, which was proposed under the title of general relativity, such as the gravitational lens, were amazing, but could not sideline the need for a physical description of gravity. Even Einstein in 1916 proposed the importance of a quantum explanation of gravity under the title of quantum gravity. For this reason, many scientists do not consider space-time to be fundamental. The fact is that space and matter are intermingled and inseparable, so the physical nature of time and the mechanism of its origin must be investigated, which is investigated in this article.

Keywords: virtual and real space-time, time and entropy, Dirac and subquantum, hidden layers of physics

Intuitive understanding and the speed of light

Human understanding of space and time is intuitive and visualizes space as an expanse without matter, while space does not exist without matter or its physical effects. The concept of time is more complicated than space, because the biological clock in the brain affects our intuitive understanding of time, and we feel space and time independently of each other.

Until the late 19th century, physicists had no problem with an intuitive understanding of space and time. According to Maxwell's equations, the speed of light in the vacuum is constant. In Galilean relativity, for an observer moving towards the source of light, the speed of light is faster

than when moving away from it. But in Michelson's experiment, which was based on the speed of light, its inaccuracy was revealed.

In Einstein's special relativity, the speed of light in vacuum is constant for all inertial observers, which is inconsistent with human intuitive understanding of space and time. Space-time unity was proposed by Minkowski with four-dimensional coordinates. In relativity, every event is a point in the universe defined by four coordinates in space-time (figure 1).

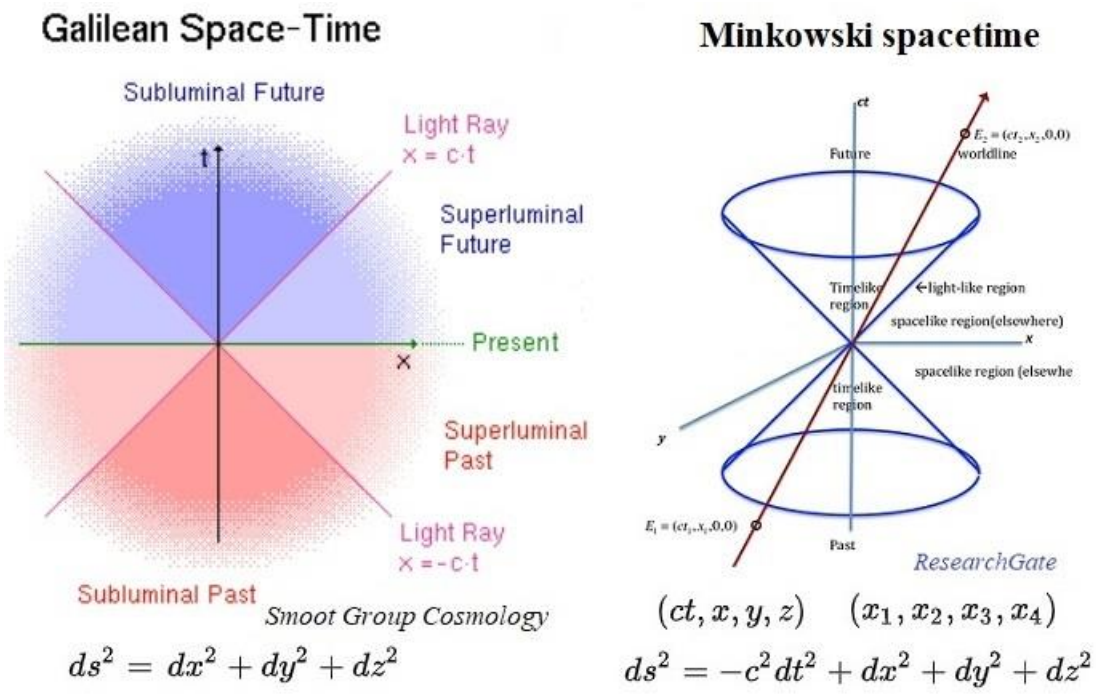

Fig1: Galilean relativity and special relativity

Relativity and geometry

With the emergence of four-dimensional space-time, its geometric form was questioned. In special relativity, where comparative frames are inertial, space-time is flat and its geometry is Euclidean. But in general relativity, where the comparative frames are accelerated and Einstein's field equations explain gravity, the shape of space-time is curved and non-Euclidean.

On the left side of the field equation is the curved space tensor and on the right side is the energy-momentum tensor and the space-time curvature is directly proportional to the energy flux density (figure2).

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Einstein Field Equation

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

$$\kappa = \frac{8\pi G}{c^4} \approx 2.07 \times 10^{-43}\ \mathrm{N}^{-1}$$

$$G_{\mu\nu} = R_{\mu\nu} - \tfrac{1}{2} R g_{\mu\nu}$$

$$G_{\mu\nu} = \kappa T_{\mu\nu}$$

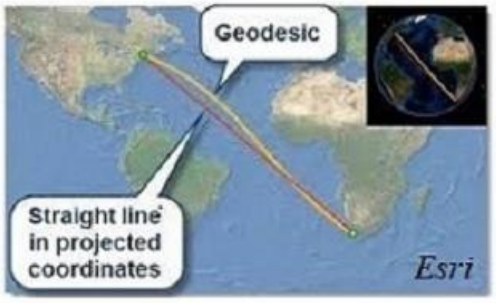
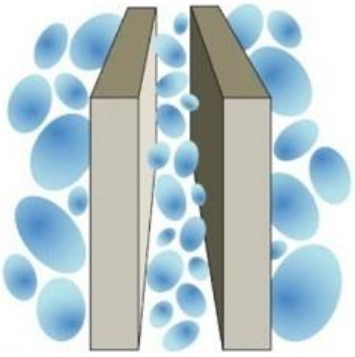


Fig2: The field equation and the curvature of space

New theories and experiences

Relativity is an intuitive theory that explains what is seen, including clock hands, and does not say anything about the physical nature of time, and is not compatible with quantum mechanics. For this reason, relativity is considered a classical theory. Quantum mechanics cannot explain the physical nature of time either. Because in quantum mechanics, a particle is point-like and unstructured, and the definition of a particle is one of the mysteries of quantum mechanics. To explain the physical reality of time, we have to start with the constituents of elementary particles.

A vacuum can yield flashes of ligh



"Virtual particles" can become real photons under the right conditions

Charles Q. Choi, Nature, 2013

Scientists Produce Particle-Antiparticle Pairs From a Vacuum

The University of Manchester, ScienceDaily, 2022

Detection of quantum-vacuum field correlations outside the light cone

Nonlocal measurement of quantum-vacuum induced correlations.

Francesca Fabiana Settembrini, et al, Nature, 2022

How the Physics of Nothing Underlies Everything

Charlie Wood, quanta magazine, 2022

Fig3: Quantum vacuum and new experiences

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In the last century, modern physics was revolutionized by experimental observations and new theories. Today, quantum vacuum and virtual particles are an inseparable part of modern physics. Physicists convert virtual photons into real photons or generate particle-antiparticles from the quantum vacuum.

Correlation of the vacuum quantum field outside the light cone can also be detected. Even the observerable universe is considered to be the product of quantum vacuum fluctuations (figure 3).

Virtual and real space-time

According to the quantum vacuum and new experiences and theories, the observable universe or real space-time and its laws are the product of virtual space-time. On the other hand, entropy is known as the arrow of time.

If the entropy of a particle is zero, it does not experience the passage of time. The existence of such a particle with different characteristics was and still is known as ether from the time of Aristotle. Dirac was the first to use the term subquantum for it. In the CPH theory, ethereal space was completed with a subquantum approach and formulated with modern physics terms (1).

In the CPH theory, ethereal space was completed with subquantum approach. In the CPH theory, space is an ocean of CPHs that always move at a constant amount of speed, does not exchange heat with the environment and its entropy is zero. Therefore, they do not experience the passage of time. This characteristic of CPHs, which always move at a constant amount of speed, makes them not stick to each other, and basically, there is no stickiness in nature (Figure 4).

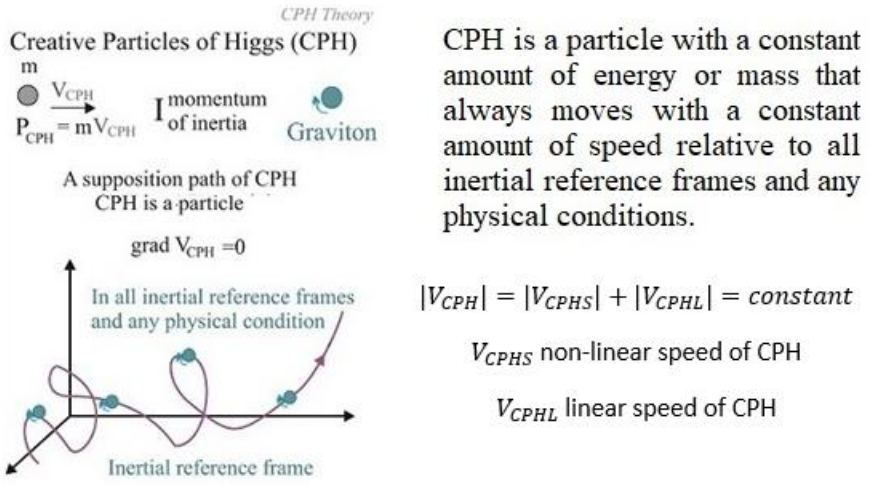

Fig4: The sum of linear and non-linear speeds of CPH is always a constant amount

Space-time and CPH theory

By interacting and combining CPHs with each other, sub-quantum energies are produced and virtual space-time is created and the ground for the creation of real space-time is provided.

When CPHs interact with each other, CPH field is excited, quantum vacuum and virtual particles are formed and the ground for the creation of real space-time is provided (2). When CPHs interact with each other, the CPH field is excited, quantum vacuum and virtual particles are formed, and from within virtual space-time, real space-time or the visible universe and the laws of physics emerge (Figure 5).

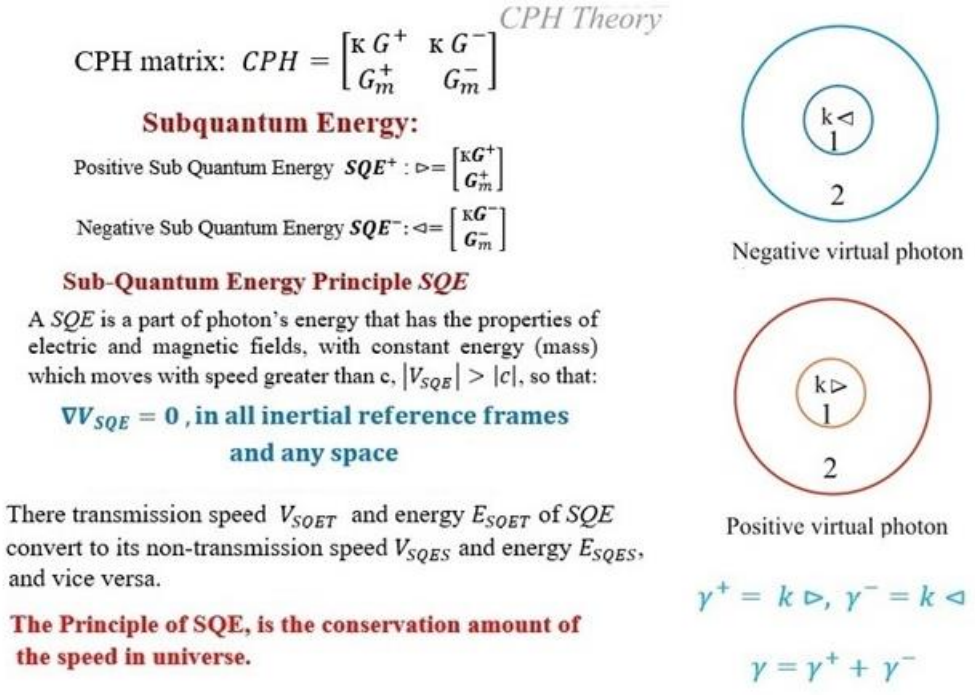

Fig5: Formation of virtual and real space-time

Entanglement of virtual and real space-time

Nature includes three interwoven and at the same time separate spaces:

1- visible space or real space-time: In visible space-time, the speed limit is the speed of light, which can be seen with the establishment of quantum electrodynamics and experimental observations, the effects of virtual space-time in real space-time.
2- Virtual space-time: Virtual space-time is a substructure of real space-time, which includes quantum fields and quantum vacuum. In virtual space-time, the lowest speed is the speed

of light. And the fastest speed is the linear speed of subquantum energy without non-linear speed.

3- non-obvious space: There is no time in the non-obvious space, the lowest speed is the sub-quantum energy speed that is created by the combination of CPHs with each other. The highest speed is the CPH speed which does not have a non-linear speed (Figure 6).

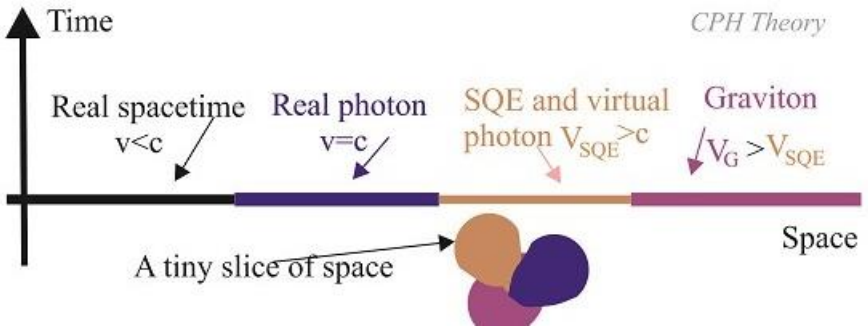

Fig6: The interweaving of real and virtual space-time with non-obvious space.

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