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From Space-time to Space

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Abstract: Time exists only as a stream of change in physical space. In physical space itself time does not exists as an physical reality in which change run. Change does not "happen" in time -- change itself is time. This understanding of time resolves some of the main problems of modern physics.
Keywords: time, space, gravitation, Lorentz transformation, EPR experiment.

Introduction

In the universe the passing of physical time cannot be clearly perceived as matter and space directly; one can perceive only irreversible physical, chemical, and biological changes in material media. On the basis of elementary perception (sight) one can conclude that physical time exists only as a stream of change that runs through cosmic space. The terms "physical time" and "change" describe the same phenomenon. Physical time is irreversible. Change A transforms into change B, B transforms into C and so on. When B is in existence A does not exist anymore, when C is in existence B does not exist anymore. Physical time is not reversal, time travels are not possible. (1)

In Newtonian physics, physical time is an independent quantity (absolute time), running uniformly throughout the entire cosmic space (absolute space). In the Theory of Relativity, time is no more an independent physical quantity - it is linked with space in four-dimensional space-time. Here physical time is understood as a stream of irreversible change that runs through cosmic space. The important point is: Change does not "happen" in physical time -- change itself is physical time. This is a different and more correct perspective than the conventional view in physics, in which space-time is the theater or"stage" on which change happens.

Experiment

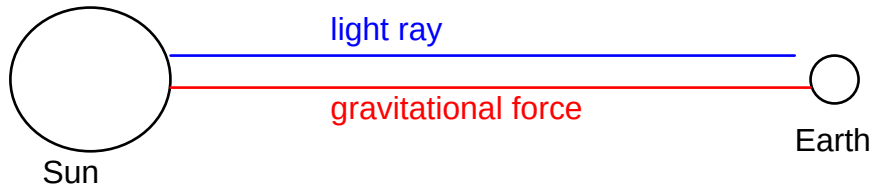
Take a ball and allow it to roll down an incline. You can perceive only the movement of the ball in space. On the basis of elementary perception (sight) one can only state that the ball has changed position in space. There is no experimental evidence that ball has moved through time as a physical reality.

Physical Space and Gravitation

According to the understanding "time is change" space-time is only a mathematical model and does not exist in the universe itself. In the general theory of relativity (GR), gravitational force is carried by the geometry of "space-time"; the "areas" of space-time with higher curvature attract each other. This idea is not backed by any experimental evidence: as "curvature of space" is only a

mathematical description it can not carry gravitational force. One can predict that physical space has a certain "density" that corresponds to the density of matter. The denser the matter, the denser the physical space. The "density of physical space" can be described in GR with the curvature of space and with the gravitational acceleration (on the Earth 9.8 m/s^2). Gravitational force can be attributed to the density of physical space. The "areas" of higher density attract each other.

Gravitational waves are vibrations of physical space and not of space-time. They do not propagate through the space as light does, they are a vibration of space itself. Gravitational force is immediate, it acts directly via physical space. The other three basic forces (electromagnetic, weak and strong nuclear force) are indirect, carried by some particle or wave that is moving through physical space. In order for "indirect forces" to act, they need to travel through space. For example: the duration of the movement of a light wave from the Sun to the Earth is around 8 minutes. For gravitational force to be transmitted between Sun and Earth no travel of wave is needed.



duration of light ray = around 8 minutes
duration of gravitatioal force = 0

Above interpretation of gravitation also resolves the contradiction that brought up hypothetical gravitational fields which should propagate faster than light: "Modern physics has introduced the concept of “fields”, such as charge around a particle or gravitation around a mass. When the particle or mass moves, its entire field moves with it. However, this cannot happen without causality. For example, the mass may cause adjacent parts of its field to move, which in turn may move more distant parts, and so on. This is what happens in any rigid body when one part of it is pushed: a pressure wave propagates through it, conveying the push to all parts of the rigid body. Therefore, fields are not a form of action at a distance. The fact that gravitational fields are seen to update faster than light can propagate, is an argument for faster-than-light propagation of forces, not an argument for action at a distance".(2) The hypothetical gravitational waves violate the principle of special relativity which considers that no particle or wave can travel faster than light do. According to understanding of gravitation presented here it is not that gravitational waves are faster of light, they do not travel at all.

Time Dilatation And Length Contraction

According to the special relativity, space-time shrinks in the direction of travel. Lorentz transformations describes this dilatation with the first and the fourth equation. Let's imagine that a train is passing a station with the speed **v**. The observer on the train throws a ball that is then rolling on the floor of the corridor. The duration (time) of ball rolling will be for him **t** (regarding the fourth equation of Lorentz transformation, see last equation below), for the observer on the embankment the duration (time) of the ball rolling will be **t'**.

$$x' = \frac{x - vt}{\sqrt{1 - \frac{v^2}{c^2}}}$$

$$y' = y$$

$$z' = z$$

$$t' = \frac{t - \frac{v}{c^2} \cdot x}{\sqrt{1 - \frac{v^2}{c^2}}}.$$

According to the understanding of time presented here, the fourth equation express only the relation between the duration of rolling ball for the observer in the train and the observer on the embankment. Observer in the train will measure the duration of rolling ball as **t**, observer on the embankment will measure the duration of rolling ball as **t'**.

$$\mathbf{t'} = \mathbf{t}\ \sqrt{1 - v^2/c^2}$$

The train is traveling through space and not through the space-time. It is not that space-time is shrinking, it is only that for the observer in the train the duration of rolling ball is shorter. There is no shrinking of space-time and no length dilatation in the direction of travel. Why should it exist? The first equation of Lorentz transformation should be written:

$$x' = x\ .$$

here must be

$$x' = x - vt$$

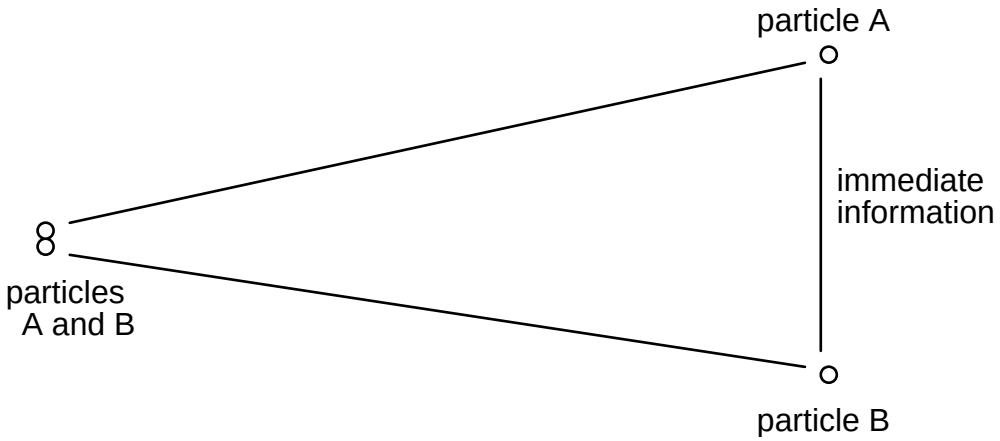
The length contraction is the mathematical invention based of the preposition of the existence of space-time. As there is no scientific evidence of space-time existing as a physical reality, the idea of length dilatation can be abolished. There is no experimental evidence of existence of length contraction.

EPR Experiment

"Time as change" brings new light about experiment of Einstein, Podolsky, and Rosen (EPR). This experiment shows that quantum A and quantum B which have been together and then sent into space in opposite directions "know" each other in an instant moment. When the spin of particle A is unilaterally changed, an astounding experimental result is that the other (B) particle's spin "immediately" flips of its own accord. Furthermore, the means by which the information of the first spin flip is transferred to the second particle (so that it too can flip) is information which is required to travel faster than the speed of light. While the information transfer may not be

simultaneous (limits on the experimental apparatus prohibits any proof of simultaneity), it nevertheless --within the time frame of the Planck constant or speeds in excess of the speed of light-- must connects the two particles in some fundamental manner.

One could predict that in the EPR experiment the information medium between two particles is physical space itself. As with gravitational waves between Sun and Earth, also information between particle A and particle B is immediate.



Gravitation, Consciousness, Telepathy

Penrose and Hameroff's research suggests that the gravitational force of physical space is a basis for human consciousness: the force of quantum gravity acting on the mass of neurons within the brain may be responsible for the emergence of consciousness. The process is fundamentally related to the influence of quantum gravity on microtubule networks within the neurones. (3,5) The discovery of Penrose and Hameroff consciousness cannot be interpreted only as the result of bio-chemical processes of the brain. Further research will give more clearness about the relation "consciousness - gravitational force - physical space".

Relation consciousness-gravitational field opens new perspectives in understanding of telepathy. One could predict that two persons communicate telepathic directly via physical space as particles in the EPR do.

Conclusions

The principle of special theory about the constant velocity of light perfectly corresponds to existing experimental results and also to the understanding that time exists only as duration of change in physical space. Gravitation and EPR experiment can be explained without violating principle of the maximum velocity of light.

In the universe two basic type of physical phenomenon are happening:

1. These phenomenon are carried by particles or waves. We experience them as if they are happening in time but it is not so. They are happening in space, its duration we experience as time. We are getting older only in the space and not in the time.
2. The second type of phenomena is gravitation that is carried directly by physical space. For gravitational force to act between two stellar objects no particle or wave is moving through the physical space. Gravitation is an intrinsic physical property of space itself.

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