

A-Temporal Universe

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Abstract: In scientific experiments we observe irreversible material change.. Physical time exists only as a stream of this change. Newton's time is only a concept through which one experiences irreversible stream of change. Universe is an a-temporal phenomena.

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1. Introduction

1.1 Mach's Understanding of Time

Regarding existence of time Ernst Mach says: "It is utterly beyond our power to measure the changes of things by time. Quite the contrary, time is an abstraction at which we arrive by means of the changes of things". (1)

Mach's understanding of time corresponds perfectly experimental facts. 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..

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The question arises: Why is it that irreversible physical time is experienced as past, present and future? The answer is obtained by analysing the scientific way of experiencing. The human senses perceive a stream of irreversible change. After that the stream of change is experienced chronologically through an abstract time that exists only as a part of the scientific mind. Linear time of Newton is only an abstraction and does not exist as a physical reality. It seems that Einstein was aware of this fact, but at the beginning of the last century it was too early to deny existence of Newton's time, so he linked time to space and created space-time where time represents fourth coordinate.

Let's look at the relationship between physical time and linear time of Newton by carrying out an experiment. Take a ball and allow it to roll down an incline. You can perceive only the movement of the ball in space, but you experience that the ball has also moved through time. How come? Perception passes first through linear Newton's time and then the experience occurs. That's why you experience the movement of the ball in time. But on the basis of elementary perception (sight) one can only state that the ball has changed position in space.

Newton concept of time exists only as a concept of the mind through which we experience the universe. Further on physical time will be called "irreversible stream of change" because this term corresponds better experimental facts. Here time is totally integrated into physical space.

Changes are irreversible, they have no duration, we give it the sense of duration comparing it with the clocks. Clocks are mechanisms that correspond to the movement of the stellar objects. 24 hours corresponds to one cyclic movement of the Earth, one year corresponds one cyclic movement of the Earth around Sun. One can say that with clocks we measure duration of change, but one has to be aware that changes have duration when experienced through the Newton concept of time. In the universe itself time does not run as we experience it, there is no past, present and no future. Stream of change has no arrow, "arrow of time" exists only in Newton's concept of time.

In diagrams of physics irreversible stream of change should be presented as a vertical coordinate. Let's see this on the example of the rolling ball that rolls down an incline between point A and point B. Duration of rolling ball is 5 seconds, the distance between A and B is 2 meters. The speed is 0,4 meter per second.

2. Theory of Relativity Without Time

This understanding of time brings new light into "problem of twins" in Special Relativity. The twin-brother in faster space ship is getting older slower than his brother on the Earth because in a space ship the speed of change is slower than on the Earth. That's

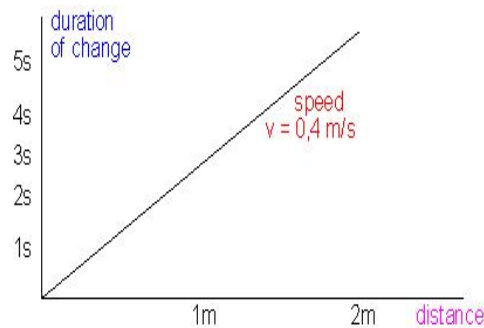


Fig. 1

why twin-brother after travelling few years when returning on Earth is younger than his twin-brother. In the space-ship there is no "time dilatation". Time does not run on the Earth and not in the space-ship. There is also no "length contraction" because it is not that in faster inertial system the "space-time is shrinking", it is only that the speed of change is slower. Regarding General Relativity experiment with high precise clocks shows that clocks run slower at the sea side than on the top of the high mountain. It is because the speed of change is slower where gravitational field is stronger, not because time runs slower in stronger gravitational field..

This understanding of time offers a new understanding of gravitation. In Morgan Manuscript Einstein says that general theory of relativity can not be imagined without gravitational ether which is non homogeneous, and its state has no autonomous existence but depends on the field generating mater. Since in the new theory, metric facts can no loner be separated from true physical facts, the concept of space and ether merge together. Merging of physical space and gravitational ether introduces "non homogeneous density of physical space" that corresponds to the density of matter. The denser the matter, the denser the physical space. In General Relativity density of physical space corresponds and can be mathematically described with the curvature of space. Gravitational force is attributed to the density of physical space. The "areas" of higher density attract each other. Gravitational force is immediate, it acts directly via density of physical space. (2)

No travel of particle or wave is needed to transmit gravitational force. Gravitation has no speed. Other three basic forces (electromagnetic, weak and strong nuclear force) are indirect, carried by some particle or wave that is moving through physical space. "Indirect forces" to act need to travel through physical space and have a certain speed.

Van Flandern considers that gravitational waves should be faster than light: "The mathematical equations of general relativity are unique, but their physical interpretation is not. Confusion reigns over the difference between the field and geometric interpretations of GR, the meaning of gravitational force in a GR context, the distinction between grav-



Fig. 2

itational waves and force variations, and the applicability of aberration to gravity. The geometric interpretation of GR, argued by Carlip, blurs these concepts.. We show that aberration has been suppressed in the GR equations of motion through setting gravity's propagation speed to infinity; and that the absence of aberration cannot be explained through some mathematical "cancellation" because that would cancel tidal forces too. The mere existence of Lorentzian relativity as an experimentally viable model for the relativity of motion nullifies the "proof" that nothing can propagate faster than light in forward time. Experiments indicate that gravity and electrodynamic forces both propagate far in excess of lightspeed". (3)

According to understanding here the hypothetical gravitational waves that travel faster than light should have no speed. Their speed should be zero. The postulate of maximum velocity of light is saved.

3. A-temporal Universe in Dynamic Equilibrium

Equilibrium The basic idea here is that universe is a-temporal, has no beginning and no end. According to the first law of thermodynamics one can assume that in the universe energy cannot be created or destroyed, it can only be transformed; the sum of the energy of matter and the energy of space is always constant: $E_{\text{matter}} (Em) + E_{\text{space}} (Es) = E_{\text{constant}} (Ek)$. In the first moment after the big bang $Em = 0, Es = Ek$. In the subsequent moments Es transforms into Em , and the transformation is over when Es and Em are balanced: $Es = Em (Es = Ek/2, Em = Ek/2)$. With the formation of black holes, the transformation of Em into Es starts, Em is falling towards zero ($Em \rightarrow 0$), Es rising towards $Ek (Es \rightarrow Ek)$. With the transformation of matter into space the density of cosmic space is increasing. This process increases the gravitational forces between galaxies.. The speed of expansion of the universe is decreasing, at a certain point the expansion will stop and the universe will start to collapse into an enormous black hole that then explodes into a new big bang. Big bangs are cyclic. The universe is in dynamic equilibrium (further on only DE). (4)

With the dynamic equilibrium between density of matter and density of space can be

also explained astronomical observations which show that the Active Galactic Nucleus (AGN) continuously emits fresh gases. These gases then form stars and planets.. When the stars get "old" they shrink and the gravitational force of the AGN sucks them back in. In the AGN the density of space is so strong that the energy of matter disintegrates back into the energy of space. This keeps the density of space in the AGN high, so it continuously emits fresh gases. The transformation "matter–space–matter–space–matter" is permanent, the AGN is the "rejuvenator" of matter..

The majority of cosmologists still consider the "red shift" as proof of the expansion of the universe, but they accept that part of the "red shift" is a result of the light "escaping" out of the strong gravitational field of the galaxies from which it comes to reach Earth. Van Flandern view is that the red shift is not proof for an expanding universe, moreover several discoveries confirm the opposite. (5) According to understanding here "gravitational red shift" is caused by high density of physical space around galaxies. Also the light ray is bending by passing the Sun because of density of physical space around the Sun and not because the space around sun is curved. Curvedness of space in GR is only a mathematical model that describes density of physical space.

It seems that the cosmological model of self-renewing galaxies has more experimental evidence than the cosmological model of cyclic "Big Bangs". However in the both of models the DE is a basic universal law. DE between space and matter is recreating the universe, DE between gravitational and tangential forces make it possible for planets to orbit around the sun, for the sun to orbit around the centre of the galaxy, the water circulation "ocean–evaporation–clouds–rain–rivers–ocean" is in DE, life chains of fauna and flora are in DE.

4. Entropy of the Universe and Evolution of Life

The universe is a "perpetual" system. It does not need energy to move with. It cannot be compared to the machines created by man where "for some work to be done some energy is needed". The second law of thermodynamics cannot be applied to describe universal dynamics. It is valid only for machines. The total energy of the universe and of a single galaxy sums to zero. An increase in the entropy of gas being produced in big bang or in AGN does not influence its total entropy.

Also for the movement of an stellar object no energy is needed. For example the force of attraction between physical spaces of the Earth and Moon is equal to the centripetal force which pulls the Moon from the Earth [$F_{\text{attraction}} (F_a) = F_{\text{centripetal}} (F_c)$]. For the movement of the Moon around the Earth no energy is needed [$F_a - F_c = 0$]. By moving the stars and planets the universe does not get "tired". Movement is its intrinsic property.

In the self-renewing galaxy the evolution of life is a consistent part of the evolution of the galaxy. It can be understood as a process that is continuously developing towards a total entropy of the galaxy that sums to zero. The relationship between life as a continuous negentropic process and the zero entropy of the galaxy can be described with the following diagram:

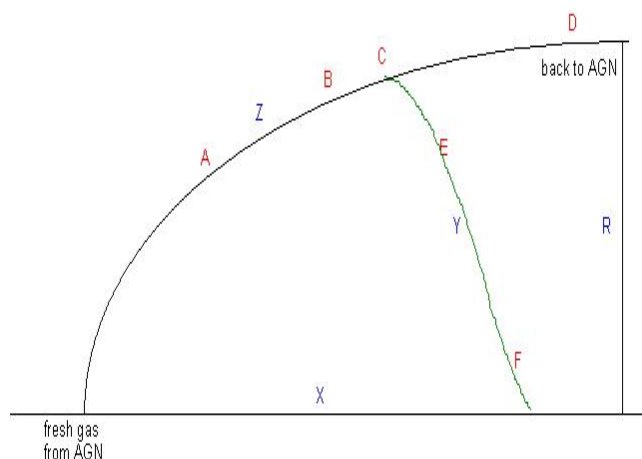


Fig. 3

X stands for a total entropy of the galaxy that sums to zero
 Y stands for the evolution of life
 Z stands for increasing of the entropy of matter
 R stands for the renewing process of "old" stars into fresh gas in AGN
 A stands for creation of stars B stands for creation of planets
 D stands for old stars
 C-E stands for chemical evolution
 E-F stands for biological evolution
 F- stands for evolution of conscious beings

(The diagram is also valid for the theory of Big Bang, fresh gas comes from big bang and renewing process of old stars happen in "Big Crunch")

According to this understanding evolution of life on the planet Earth is part of the evolution of the galaxy "Milky Way".

Several experiments in the space-ship where gravitational field is weak show that functioning of living organism is related to the gravitational field, which means to the physical space. Experiment carried out at the University of Lubiana, Slovenia in 1987-90 shows that physical space around living organism is more dense than around same dead organism. Gravitation works on living organism stronger than on the same dead organ-

ism. Experiment shows that life is directly related with physical space. This means that also in the evolution of life physical space presents an active component. (6)

This idea is supported by the discovery of basic organic molecules necessary for the development of life in the whole of observable space. Universal space is in the phase of chemical evolution which on the Earth and similar planets has continued into biological evolution. Astronomers discover many planets similar to the Earth.. Life could also develop there. All over our galaxy and also in other galaxies life is developing towards conscious species. Probably we are not alone in this vast universe.

5. Conclusions

There is no experimental evidence of existence of physical time in which material change run. In the universe one can perceive only irreversible stream of change. Existence of physical time should be valuated on the basis of elementary perception (sight) and not on the basis of the rational thinking. Newton time exists only as a concept of the mind, universe is an a-temporal phenomena in a permanent dynamic equilibrium. Evolution of life is a consistent part of the evolution of the universe.

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