

Time is run of Clocks in Timeless Universe

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Abstract

Clocks are systems for measuring frequency, velocity, duration and numerical order $t_0, t_1, t_2, \dots, t_n$ of physical events. Time t obtained with clocks is not a fourth dimension X_4 of space, time t is only a component of $X_4 = i * c * t$. This view of clock/time as a measuring system sees physical phenomena running exclusively in space and not in time. This view is supported with several experiments which confirm that time t of physical event can be zero. Universe is timeless phenomena. Past, present and future exist as a psychological time in the mind only not in the universe. We experience motion i.e. change in the universe through the frame of psychological time. We “project” linear time “past-present-future” into the universe, however it is not there. This view also resolves several ancient problems regarding time and motion.

Key words: time, space, space-time, run of clocks, numerical order, frequency, velocity, duration

Introduction

Time t is not an independent dimension of space-time. Time t is only a component of X_4 that is not temporal, it is spatial too. In physics the spatial distance d is a product of velocity v and time t : $d = v * t$. Mathematical formalism $X_4 = i * c * t$ confirms that the fourth coordinate X_4 is spatial too. In Special Theory of Relativity time t obtained by clocks is only a component of $X_4 = i * c * t$. Planck time t_p is the basic unity for measuring frequency, velocity, duration and numerical order of physical events. Planck time is calculated: $t_p = \frac{c}{l_p}$, where l_p is the Planck distance:

$l_p = \sqrt{\frac{\hbar G}{c^3}} \approx 1.616252(81) \times 10^{-35}$ meters, G is the gravitational constant and \hbar is the reduced Planck constant. Planck time as a basic unit for measuring material change is not a part of space. The clock/time run is a reference system to measure physical events, i.e. material change running in space (1).

That time is not part of space is discussed in recent research: The fact that

imaginary numbers appear when computing space-time intervals and path integrals does not facilitate that when multiplied by i , than time intervals become basically identical to dimensions of space. Imaginary numbers show up in space-time intervals when space and time separations are combined at near the speed of light, and spatial separations are small relative to the time intervals. What this illustrates is that although space and time are interwoven in Minkowski space-time, and time is a fourth dimension, time is not spatial dimension: time is always time and space is always space, as those t 's keep showing us. There is always a difference. If there is any degree of space, regardless how microscopic, there would appear to be inherent continuity i.e. interval of time (2). Space and time are interwoven in a sense that time t obtained with clocks is a component of fourth dimension of space X^4 . Time is always time and space is always space in a sense that time is run of clocks in space. Interval of time t we obtain with a clock. There is no time in space behind a clock run.

Discussion

According to the “time is run of clocks in space” Achilles surpasses Tortoise in space only and not in time. Clock/time is a measure of speeds of Achilles and Tortoise. You imagine Achilles at the point A , Tortoise at the point T . Between A and T there is a distance d . When they start running into the same direction we activate a stopwatch. When Achilles is surpassing Tortoise we stop stopwatch. On the stopwatch we see 10 seconds. Achilles has passed 10 meters, his speed is $v = 1\text{ms}^{-1}$. Tortoise has passed 1 meter, its speed is $v = 0,1\text{ms}^{-1}$. At the starting points the distance d between Achilles and Tortoise was 9 meters. Achilles and Tortoise they both move in space only and not in time. Clock/time is a measuring device for their motion.

Zeno's arrow is not moving from the past, being still in the present and moving on into the future. Zeno's arrow is moving in space only and not in time. Clock/time is a measuring device for arrow motion.

Time travel into past is not possible. One can travel in space only. Twin living on the moon is getting older faster than his twin-brother on the earth because speed of material and biological change is faster on the moon than on the Earth. Both twins are getting older in space only and not in time. With clocks we measure speed of their biological change that depends on the strength of gravity in a given volume of

space.

For certain physical phenomena clock/time is zero, since no measurable time elapses for them to happen. For example in the article *Attosecond Ionization and Tunneling Delay Time Measurements in Helium* by Eckle et al., a conclusion is drawn that "an electron can tunnel through the potential barrier of a He atom in practically no time" (3).

Also in EPR experiment the elapsed time for quantum entanglement is zero. EPR does not happen in space and time, EPR happens in space only. Here space in which particles exist is being considered as a direct information medium between entangled quanta (4).

The space as an "immediate information medium" resolves the causality problem of the Fermi two-atom system: "Let A and B be two atoms or, more generally, a "source" and a "detector" separated by some distance R. At $t=0$ A is in an excited state, B in its ground state, and no photons are present. A theorem is proved that in contrast to Einstein's causality and finite signal velocity, the excitation probability of B is non-zero immediately after $t=0$. Implications are discussed" (5). The excitation probability of B is non-zero because the space in which atoms exist is an "immediate medium of excitation".

Conclusions

Clock/time is a measuring device for physical events running in space. There is no experimental evidence of time existing behind the run of clocks. Time is run of clocks in space. Fourth dimension X_4 of space is spatial too. Time t obtained with clocks is only a component of $X_4 = i * c * t$.

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