

TIME IS RUN OF CLOCKS IN ATEMPORAL SPACE

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People like us, who believe in physics, know that the distinction
between past, present, and future is only a stubbornly persistent illusion."

Albert Einstein

<http://rescomp.stanford.edu/~cheshire/EinsteinQuotes.html>

Abstract

Today in physics there are two fundamental approaches on time. First is that with clocks we measure time that is a consistent part of space. According to this approach clocks run in space-time as a basic physical reality. This approach has no experimental evidence, space-time as a fundamental physical reality in which material change run cannot be experimentally observed. Second approach is that time is not part of space; time is run of clocks in space. Each experiment conforms that with clocks we measure duration and numerical order of material change that run in space. There is no experimental evidence that clocks run in time, clock's run itself is time. Run of time is relative; speed of clocks depends on strength of gravity force in different areas of space. Space itself is timeless (atemporal).

Key words: time, space, duration, numerical order, information

Introduction

There is no experimental evidence for space-time existing as physical reality. In physical experiments one observes stream of material change in physical space only. Physical space is a medium in which massive bodies and elementary particles move. Space-time is not a physical reality, space-time is merely a mathematical model with which one describe stream of material change in physical space. With clocks we measure duration and numerical order of material change that run in physical space. Here time is defined as: Time is run of clocks in physical space. Physical space itself is timeless (atemporal). Travel into past are out of question.

Discussion

Several researches confirm that space-time as an “arena” of the universe does not correspond to the physical reality. They propose “timeless space” as an arena of the universe.

An article discussing that model of space-time is not corresponding physical universal space and could be replaced with atemporal fractal geometry of state space was recently published on arxiv (1).

An article discussing possibilities that space is timeless was recently published in arxiv: “We illustrate our proposal using a toy-model where we show how the Lorentzian signature and Nordstroem gravity (a diffeomorphisms invariant scalar gravity theory) can emerge from a timeless non-dynamical space” (2).

Time and clocks are man inventions. Motion is primary, time is secondary. Ernst Mach said: “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”(3).

Time is a scientific tool that permits us to build up cosmological models of the universe. Time as a run of clocks plays no role in the universe. Julian Barbour is saying in his article “The Nature of Time”: “I will not claim that time can be definitely banished from physics; the universe might be infinite, and black holes present some problems for the time picture. Nevertheless, I think is entirely possible – indeed likely – that time as such plays no role in the universe” (3).

Relativity of Time

According to this understanding of time in the Special Theory of Relativity in a faster inertial system the speed of clocks (time) and material change in general, is lower than in a slower inertial system. In General Theory of Relativity in physical space with stronger gravity the speed of clocks (time) and material change is lower than in cosmic space with a weaker gravity field.

This understanding of time resolves the problem of twins. They do not live in time; they live in space only. A brother in a high-speed spaceship is getting older slower than his brother on Earth, but both are getting older in a physical space only and not in time. With clocks we measure biological changes in their bodies.

Direct Quantum Information

Some research shows that quantum direct communication is a real phenomenon: “We show how continuous-variable systems can allow the direct communication of messages with an acceptable degree of privacy. This is possible by combining a suitable phase-space encoding of the plain message with real-time checks of the quantum communication channel. The resulting protocol works properly when a small amount of noise affects the quantum channel. If this noise is non-tolerable, the protocol stops leaving a limited amount of information to a potential eavesdropper”(4).

Here it is considered that information does not move in space-time, it moves in physical space only. Physical space itself is immediate information medium between quanta.

Also in the EPR experiment physical space is immediate information medium between elementary particles. There is no information signal in form of photon or some other particle traveling between particles A and B. Time of information transfer between particle A and particle B is zero (5).

Causality problems for Fermi's two-atom system

Physical space as an “immediate information medium” resolves the causality problem of Fermi two atoms 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 causality and finite signal velocity the excitation probability of B is nonzero immediately after $t=0$. Implications are discussed”(6).

Excitation probability of B is nonzero because space in which atoms exists is an “immediate medium of excitation”. There is no time needed for information or excitation to pass from A to B . Time is only a measure for motion of excitation from atom A to atom B in physical space.

Immediate Physical Phenomena

According to understanding here physical phenomena can be immediate. One can also say “timeless” or “atemporal”. Time t for these phenomena to happen is zero. Experiment from which they conclude that an electron can tunnel through the potential barrier of a He atom in practically no time was carried out recently (7).

An article on arxiv a system of diagrams is introduced that allows the representation of various elements of a quantum circuit, including measurements, in a form which makes no reference to time (hence "atemporal") (8).

According to this understanding of time Eternity is now. We are living in a timeless (atemporal) universe; past and future are existing only in the human mind (9).

Conclusions

Material change does not run in time, they run in physical space only. Physical space itself is timeless (atemporal). Some physical phenomena that run in atemporal physical space are immediate. Time for these phenomena to happen is zero. Clocks are scientific tools which measure time as a duration and numerical order of material change that run in timeless physical space.

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