PHYSICS AT THE THRESHOLD OF OVERHAUL

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Time and the **speed of light** are the concepts on which a good part of physics is based. The strength of physics is commensurate with the strength of their definitions. The article highlights the vagueness of their conceptions and hence the need for an overhaul of physics.

Introduction

Physics is becoming increasingly complex. An ever-smaller circle of people understands and can assess the credibility and solidity of physical theories. In the article, I critically analyse the concepts of **time** and the **speed of light**. Definitions of the concepts are perhaps mistakenly regarded as definitive.

Time

The concept of *time* was understood differently in various historical periods. Leibniz and Kant believed that time[1] is a mental construct for determining the sequence of events. In the relationship between mass, force, and acceleration, Newton recognized time as a physical condition. The acceleration time of a body is unambiguously based on the mass that we accelerate and the forces of acceleration.

The Earth also accelerates radially around the Sun. The orbital period of the Earth around the Sun is therefore determined by the distance of the Earth from the Sun, as well as by its mass and the Sun's force of attraction. Time is therefore not only a mental construct.

The theory of relativity[2] conceives time in its own way. Here, I am illustrating the notion of time in the theory of relativity with the example of Halley's Comet[3] which is revolving around the Sun and approaching the latter approximately every 75 years.

The motion of a comet according to the theory of relativity affects the speed of the course of time on that comet. According to the theory of relativity, time (clock) on Halley's Comet runs slower than on the Sun.

1 ***Time*** - *https://en.wikipedia.org/wiki/Time*

2 ***Theory of relativity*** - https://en.wikipedia.org/wiki/Theory_of_relativity

3 ***Halley's Comet or Comet Halley*** - *https://sl.wikipedia.org/wiki/Halleyjev_komet*

Despite the different speeds of time on the Sun and on the Comet, both encounter each other simultaneously. Even if we measure different orbital periods of the Comet on the Sun and on the Comet, we can see the proximity of the Sun from the Comet at the same time as the Comet's proximity from the Sun.

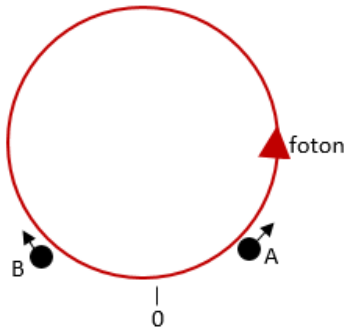
For the sake of comprehensibility, hereafter, I shall take into account the thought model of revolving of the Comet around the Sun defining that both of them are at the same location at the same time when they encounter each other.

In relativity, we readily accept the stereotype that the clock on the Comet at the moment of their encounter shows a different time than the clock on the Sun. This is in contrast to the synchronousness of their encounter. If their hours do not show the same time at the moment of their encounter, there is no need to doubt the synchronousness of their encounter. Namely, what is questionable here is the way of measuring time.

The encounter of the Comet and the Sun occurs within one and the same event in a single point of the four-dimensional space. The relativistic concept of time does not allow the recording of their encounter in a single point, which is contradictory and does not reflect the actual encounter.

Speed of light

Let us imagine a photon[4] circling around a black hole[5], as the picture shows. The gravity of the black hole curves the movement path of the photon into the shape of a circle.



Two points that travel along the circumference on which a photon is circling detect different photon speeds

From point 0, geometric points A and B appear simultaneously with the photon, each in its own direction. The points travel slowly along the photon circumference. After the finished circle, both points and the photon return simultaneously to point 0.

The photon is faster, therefore, during the time of one full circle by points A and B it makes N circles. The points encounter the photon. They do not perceive the photon and their encounters are monitored at the level of geometry.

Point B, moving in the opposite direction than the photon, encounters the photon N + 1 times. Point A, which moves in the direction of the photon motion, encounters the latter N-1 times.

Points A and B finish the circle simultaneously. Equal times of the circling are the result of the simultaneous departure of the points from point 0 and their simultaneous return to point 0 after the completed round-trip.

The points (observers at those points) find that point A detects less encounters with the photon than point B, and thereby also shorter photon paths. Point A detects the path of the photon in the length of (N-1)-times the '*length of the circumference*', while the point B detects the path in the length of (N + 1)-times the '*length of the circumference*'.

The points detect different lengths of photons paths within the same time. They detect different photon

4 ***Photon*** - https://sl.wikipedia.org/wiki/Foton

5 ***Black Hole*** - https://sl.wikipedia.org/wiki/%C4%8Crna_luknja

speeds. Our belief that light has the same speed in all situations is thus perhaps not justified.

Theory of relativity

As a rule, we describe phenomena in mathematical language. Both mathematical records and the natural language allow the description of the real states as well as errors. In the same way that I can describe mistakes in natural language I can also describe them in mathematical language. In a description of mistakes, we can not find formal linguistic or mathematical discrepancies.

Lorentz transformations[6], upon which the theory of relativity relies, can not be reproached as inconsistent. Nevertheless, this does not guarantee that the theory of relativity objectively describes natural phenomena at high speeds. The established incorrect starting point on the speed of light, in spite of its internally consistent mathematical record, describes relativity in an erroneous way.

The theory of relativity is often attacked but it somehow always manages to survive all the attacks. The critics of the theory of relativity seek its weak points in mathematical discrepancy, where there are none. Intuitive disagreement with relativity is due to the dubious starting point on the speed of light.

Direct measurement of the speed of light from a moving illuminant has not yet been performed. Physics therefore established the theory of relativity indirectly. Physicists generally argue that Maxwell's equations[7], as written by Maxwell, express the speeds of light that are the same in all conditions, which is not true[8]. They declare that the Global Positioning System GPS[8] would not work without the basics of relativity theory, although it does not depend on the laws of relativity theory[10]. As a proof of relativity, we mention the time of muon decay[9], the radiation of double stars[10], etc. I presented objections to the above arguments in the 'Essay on Light' booklet[11], and here I shall only use summaries.

The wavelength of the EM light wave determines the *'Rot'* part in Maxwell's equations. There is no variable in the speed of the source of light nor time in this part. Consequently, the wavelength of light does not depend on the speed of light. The GPS system can not take into account the speed between the GPS satellite and the receiver on Earth, because their mutual speed is constantly changing with the overflight of the satellite over the receiver. Measurements of the wavelength of the light from a double star do not show fluctuations in the wavelength in relation to the revolving of stars. The same wavelength of the light from a double star, at a changing frequency, implies the influence of the speed of illuminant on the speed of light. These phenomena are therefore easier to interpret as different speeds of light in different circumstances.

An unequivocal answer to these questions could be given only by results of measurements of the speed of light from a moving source that have not yet been conducted. Measuring the speed of light from a moving light source[12] is feasible, technologically undemanding, however, not yet performed.

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6 ***Lorentz transformations*** - *https://sl.wikipedia.org/wiki/Lorentzova_transformacija*

7 ***Maxwell's equations*** - https://sl.wikipedia.org/wiki/Maxwellove_enačbe

8 ***Global Positioning System*** - *https://en.wikipedia.org/wiki/Global_Positioning_System*

9 ***Muon Experiment*** http://hyperphysics.phy-astr.gsu.edu/hbase/Relativ/muon.html

10 ***De Sitter double star experiment*** - *https://en.wikipedia.org/wiki/De_Sitter_double_star_experiment*

11 *In the booklet entitled* ***Essay on Light*** - *http://www.frozman.si/pdf/SVETLOBA.pdf - I described the previous experiments of measuring the speed of light in different circumstances and explained a method of measuring the speed of light from a moving light source.*

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Conclusion

Today's physics describes the natural phenomena complexly because of a dubious understanding of time and the speed of light. When the speed of light will be measured in various circumstances[13], for example, with a separate measurement of the frequency and the wavelength of light, physics at the theoretical level will become simplified.

A new way of thinking about the speed of light will also require the overhaul of existing physics. And the prediction of the necessary overhaul of physics is exactly the reason for delaying the execution of the missing measurements of the speed of light.

13 ***The EM properties of light*** - http://www.frozman.si/pdf/The_properties_of_light.pdf