

Causality and arrow of time in 5-dimensional Space-Time

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Abstract

So far, ¹²³⁴ it has been worked out that the circle number connects space and time and space-time is 5 dimensional, i.e. comprises three space and two time dimensions. This was also confirmed experimentally and proved that Einstein's postulate of constant speed of light is flawed, since the speed of light maps the Earth's rotation and must be given as a constant in the unit [m²/s]. Here it will be briefly illuminated how the causality principle behaves in two time dimensions and what implications the existence of two time dimensions in nature results for the "arrow of time". It is also briefly shown in which relation the speed of light is with Kepler's laws and how the connection $E=mc^2$ can be derived from Kepler's laws .

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¹ Pohl M.U.E (2022): Search for the World Formula, Scientific God Journal Vol 13 No1, <https://scigod.com/index.php/sgj/article/view/781>

²Pohl M.U.E (2019): Unified Principles of Nature, Scientific God Journal Vol 10 No3, <https://scigod.com/index.php/sgj/article/view/669>

³ Pohl M.U.E. (2023); Origin of Speed of Light http://www.villa2060.org/images/papers/origin_of_speed_of_light.pdf

⁴ Pohl M.U.E. (2023): Why the 5th Dimensional Space-Time is also a Proof of Good, http://www.villa2060.org/images/papers/Why_the_fifth_dimensional_space-time_is_also_a_proof_of_God.pdf

It was derived^{1,2,3,4} and proven that space-time is 5-dimensional and, in addition to the three dimensions of length (L^3), has two angular measures as two time dimensions (T^2). For this purpose, it was first mentally analyzed¹ that speed (physical unit [m/s] – meters per second) and causality (cause and effect) have no connection and are to be considered separately.

It was shown that the use of a 4-dimensional space-time and thus a single causality principle corresponds to a modeling of the universe in which the observer stands outside the universe and observes the events in the universe without his own participation, i.e. takes a perspective of God, who does not actively intervene in events, but has the divine ability to know everything about the universe and its will. In four-dimensional space-time, man models himself as a "god" or tries to look at the universe from God's perspective in order to understand creation. To be able to understand God. At the same time, however, "science" also presumes to be able to understand God and easily falls into the fallacy of being "God" himself.

On the other hand, it was pointed out that the observer must also be modeled and actively involved in what is happening in the universe. Because that's what he is compelling as an observer. No one can deny that. Therefore, the universe must be modeled with 5 dimensions, namely three lengths for the position of the observer in space and two angular measures for the perspective that the observer takes.

In other words, in order to observe and calculate relative velocities, the observer must be thought of as a body that has an axis of rotation relative to three-dimensional space. And this is to be indicated by two angles.

Insofar as the observer has to model himself as an absolute resting point in space, all relative movements he can observe are ultimately accelerated movements. This is easy to explain, because an accelerated motion on a straight line in three-dimensional space always corresponds to a circular motion considered from three-dimensional space. And around the observer, only circular movements or curved paths can exist. In other words, when I, as an observer, turn in circles to "look around" in the universe, then everything "at rest" in the universe moves at exactly the same speed, namely the speed that the observer rotates around his own axis to observe the universe. However, if the observer rotates in circles, then an object does not move at all in the direction of its axis of rotation (velocity = 0) and an object on the equatorial axis moves at maximum speed. This is the speed of light, or the principle behind the idea that everything in the universe can move at a speed from 0 to this "speed of light," relative to the stationary observer.

In summary: We model the observer (us) as a point in space (3 space dimensions), which has an axis of rotation (two angular measures as time dimensions) which should define the "direction of view" of the observer and a rotational speed defined as a natural constant, with which the observer rotates around this axis in order to be able to look in all directions. This "arbitrarily" agreed speed determined by us should be called here as "speed of light" or universal natural constant or alternatively "universal scale".

Contrary to Einstein's assertion, "this" speed of light is not to be given in the unit [m/s], but in the unit [m²/s] as an expression of the fact that in addition to the axis of rotation (longitudes), the latitudes also exist as a second time dimension and that all movements appear to the observer in the point of the universe as accelerated movements, i.e. "speeds" in the sense of the unit [m/s] do not exist at all.

So if I, as an observer, turn around my axis to describe the universe, then objects that move in space in a straight line unaccelerated describe elliptical orbits in which, according to Kepler's discoveries, the same surfaces are exceeded in the same times. According to the general relativity of motions, a constant unaccelerated motion is therefore always to be given in the unit [m²/s] and not in [m/s] as Einstein thought. An accelerated movement then hung with [m²/s²].

Here is a visualization of how the speed of light can be interpreted as "maximum speed" under the outlined conditions for a model of reality:

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Phenomenon „speed of light in vacuum“, why it is „constant“, why and how is it related to gravity

„Speed of light“ is not a natural constant, but just a convention to define a universal Ruler (universal clock) for the universe, so that all relative motions and accelerations (forces) can be related.

As the observer must define his own rotational speed by convention, the speed of the observed always is found between 0 and the defined ruler, which represents „1“

Nothing can go faster than „1“ from perspective of the observer, that scales the universe from 0 to 1 (infinity)

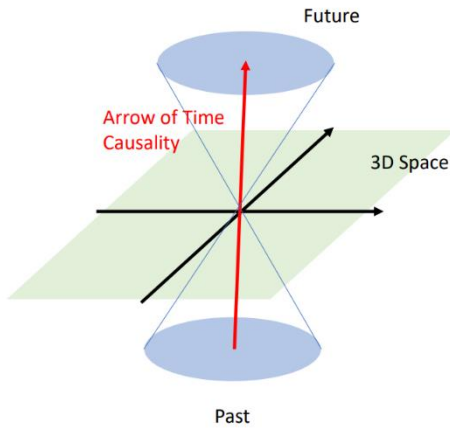
Speed of observer around its axis of observation setting $time_{observer} = „1“$ in [m²/s]

In order to outline the significance of 5-dimensional space-time for the principle of causality and the arrow of time, the four-dimensional and fifth-dimensional space-time will also be compared here.

In four-dimensional space-time there is only one time and thus only one causal series. The past must determine the future. Of course, paradoxes such as Laplace's demon arise, because actually no arrow of time should then exist, so the past would have to be able to be calculated completely from the future and the universe would have to resemble a fully determined

inanimate machine. But that is obviously not the case. So where is the mistake or why can't we travel back in time?

4D Spacetime

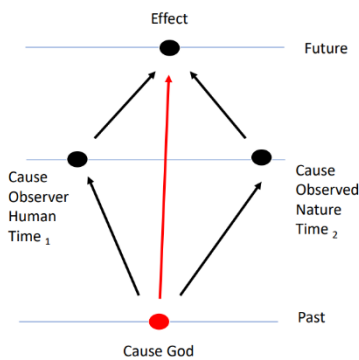


In Einstein's four-dimensional space-time, which is conceptually based both in general relativity and in quantum theory, neither the past nor the future can be calculated and both are in principle indefinite (indetermined with respect to quantum theory), but at the same time they should be determined by the arrow of time in the theory of relativity. It therefore seems paradoxical that processes always run in one direction and cannot be reversed, although they should actually be reversible if there is only one time dimension and thus a clear causal chain. This is a paradox, but –

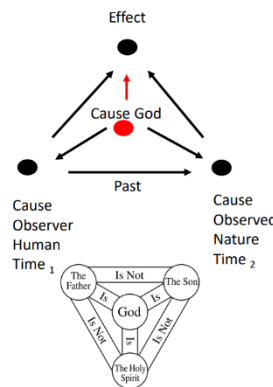
as explained here – it simply has its origin in Einstein's fundamental misinterpretation of nature.

If one also takes into account the observer himself in physical theory – which is mandatory – then in the case of an accelerated motion (which corresponds to the action of a force) it is relatively impossible to determine whether the observer accelerates in point A in the direction of the observed point B or the observed point B in the direction of the observing point A. Cause and effect are here the same size and opposite as Isaac Newton postulated, but it is unclear whether observers or the observed are the cause of the effect.

5D Spacetime



5D Spacetime

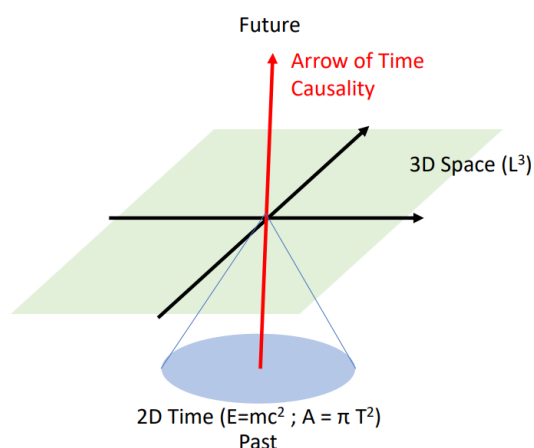


In other words: If man looks at the universe and assumes himself a free will or the possibility to act and thus represent a cause, then it is always open whether man as an observer is the cause with his action or the universe as an observed object is the cause. The effect in 5-dimensional space-time is therefore clearly determined by the force.

However, it is not possible to trace from whom this force or cause emanates.

The arrow of time or the irreversibility of events is therefore based on the fact that from the point of view of the observer IN the universe there are always two possible causes for an event (he himself is the cause or the universe).

5D Spacetime



The human being has two eyes, which not only represent two observers as points, but also each represent a different direction of view, i.e. two angles. Together with the information about whether a movement is caused by ourselves or whether a movement comes from the environment, our brain can calculate all relative movements in space with the axis of gravity (sense of balance) quasi in "real time". The prerequisite for this, however, is that two time dimensions, i.e. two observers or two eyes, are coordinated with each other.

Planetary orbits in 5 dimensional space : Squaring the circle in the sky

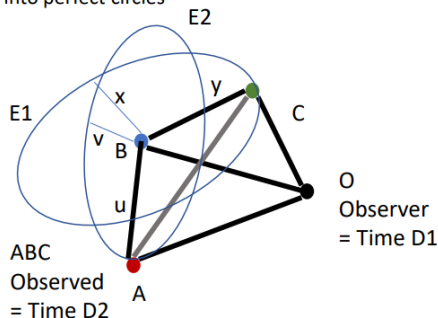
As already deduced, three-dimensional space is defined by at least four points spanning a tetrahedron (which can be irregular). But in order to be able to put movements in relation, you need a comparison speed. Thus, an observer must be able to calculate the velocities of the objects he observes based on his position in space and his direction of view and compare them with those of other observers so that all observers come to identical results. For this purpose, a "scale" must be defined that compares lengths in space and times or angles in such a way that all observers can calculate the same result.

Since all movements represent accelerated movements and thus represent a circular trajectory, we need two circular movements in different planes. So if I understand the tetrahedron in such a way that one point, the observer represents the resting point in relation to a second point, and the other two points revolve around the observed resting point, I get the desired 5-dimensional space-time. In practice, this can be done, for example, by taking into account the Earth's orbit and the orbit of Mars, i.e. two planets orbiting the Sun as an imaginary resting point. Depending on the angle of view of these two planets from the outside, they move either on ellipses or circular orbits. However, there is always an observation point where the ellipses are projected onto circular orbits. Here we can put the two planetary motions in relation by converting the ellipses into circles based on the ellipse surfaces and circular surfaces and exclude the circle number pi as an "irrational number" from the calculation, so to speak, "square" the circle and transform it into a rational number by introducing the "1" as a universal scale in physics, which maps the relationship between space and time as a universal natural constant "1":

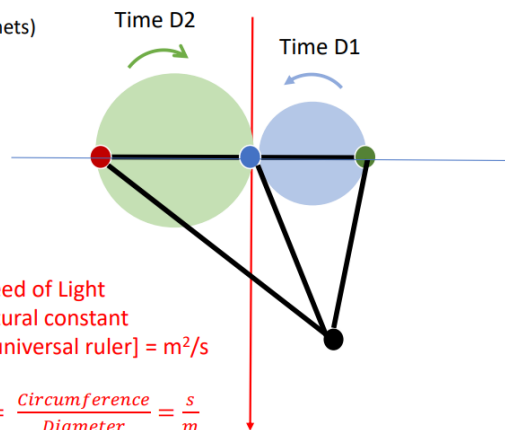
Tetrahedron defines 3D Space using two angles (2D Time)

Tetrahedron rotated to point of view of three points in line (projected into 2D time)

Any two ellipses (steady motion) in two different planes (i.e. two planets) span a Tetrahedron that defines 3D Space. Velocities can be compared relatively By observing the two ellipses from a point of view In that both ellipses are projected into perfect circles



$$\text{Surface } E1 = x \cdot y \cdot \pi = \text{Surface } E2 = u \cdot v \cdot \pi \Leftrightarrow \frac{x \cdot y}{u} = v \text{ (universal ruler for spacetime in } [\frac{m^2}{s}] \text{)}$$



Speed of Light
Natural constant
1 [universal ruler] = m²/s

$$\pi = \frac{\text{Circumference}}{\text{Diameter}} = \frac{s}{m}$$

$$\Leftrightarrow \left(\frac{\text{Circumference} \cdot \text{Meter [m}^2\text{]}}{\text{Second [s]}} = \text{Diameter [universal ruler]} \right)$$

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Contrary to Einstein's postulate of a constant speed of light, we postulate that there is only one universal constant of nature, and this represents the number "1" or a circle, i.e. the circle number π , so that

$$" \pi " = \frac{\text{Circumference of a circle}}{\text{Diameter of a circle}} = \frac{\text{unit of time}}{\text{unit of length}} \quad (1)$$

And by means of which we can define any body with an axis of rotation as a universal clock for the universe in the sense of

$$\text{universal clock or universal ruler} = \frac{\text{unit of time}^2}{\text{unit of length}} \quad (2)$$

With the knowledge that the speed of light actually represents a rotational speed, we can also easily abstract the famous connection $E=mc^2$. To do this, we simply set the surfaces of the two bodies rotating around a center in different planes from the perspective of the point from which at least one ellipse appears like a circle and thus define the universal scale that must apply to every observer.

$$t_1 \pi \cdot a \cdot r_1 = t_2 \pi r_2^2 \quad (3)$$

Where t_1 represents the measure of the first time dimension in relation to t_2

$$r_1 = t_2 \frac{r_2^2}{a \cdot t_1} \quad (4)$$

The distance r_1 stands for the physical concept of energy that results when a force F acts over the distance " r_1 ". So we insert the concept of force on both sides to simulate a "mass" that symbolizes a force F in the unit $[\text{kg m/s}^2]$ and thus

$$F \cdot r_1 = F \cdot t_2 \frac{r_2^2}{a \cdot t_1} \quad (5)$$

Results in. Now let's add the physical units for clarification

$$E_1[J] = F[N] \cdot t_2[s] \frac{r_2^2}{a \cdot t_1} \left[\frac{m^2}{m \cdot s} \right] \quad (6)$$

And resolve the units of mass and acceleration (here variable "b") to

$$E_1[J] = M[kg] b \left[\frac{m}{s^2} \right] \cdot t_2[s] \frac{r_2^2}{a \cdot t_1} \left[\frac{m^2}{m \cdot s} \right] \quad (7)$$

$$E_1[J] = M[kg] b \cdot t_2 \frac{r_2^2}{a \cdot t_1} \left[\frac{m^2}{s^2} \right] \quad (8)$$

Which then leads to a representation that maps the connection $E=mc^2$

$$E_1[J] = M[kg] \cdot \frac{b t_2 r_2^2}{a \cdot t_1} \left[\frac{m^2}{s^2} \right] \quad (9)$$

Or alternatively

$$E = M \cdot c^2 \quad (10)$$

$\frac{b t_2 r_2^2}{a \cdot t_1}$. The fact that the term actually has a dimension of x^4/y^2 is due to the fact that Einstein set $c = [x/y]$ (i.e. set one-dimensionally) and we have determined that $[x^2/y]$ is to be set as a fundamental constant and thus this "natural constant"² (i.e. c^2) has a dimension of x^4/y^2 .