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How Can SPACE and TIME be part of the SAME THING?

Jak mohou být PROSTOR a ČAS součástí TÉHOŽ?

Arvin Ash

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CHAPTERS

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SUMMARY What is Spacetime?

Are space and time the same thing? Space was thought to be nothing, an empty void with no matter in it. In 1908, Hermann Minkowski postulated that time could be thought of as a 4th dimension along with the three dimensions of space. Einstein later showed that this spacetime is a kind of geometry that can bend, affecting the trajectory and passage of time for objects. How can space and time be part of the same canvas? Space is measured in meters, while time is measured in seconds. How are the two interchangeable? The definition of spacetime is the

set of points in space and time, located with 4 numbers. This would be the location in 3 dimensional space and a time. You can also call these events. In ordinary Euclidean space, the distance between two point A and B is fairly simple to figure out. The straight line between them is the shortest path. And it's obvious also that any other path, from A to B will be longer. If we change one of the coordinates to time, the math that we need is not based on Euclidean geometry, but Minkowskian geometry (or Minkowski Geometry). The straight line between A and B does not represent distance but time elapsed between two events. A straight line represents traveling at a constant velocity between the two events, and is the MAXIMUM duration. So for example, in spacetime, if you took a curved path from event A to event B, or a zig zag path, then the elapsed time would be lower compared to the straight line between A and B, because you will have traveled more in space than in time. Einstein showed that there is no such thing as absolute time, and so that's why we have a new formulation. But how do you add time and distance together, since the units are completely different? The key is that there in important conversion factor between time and space, that allows us to convert one to the other. And that conversion factor is, the maximum speed limit of the universe, that is, as far as we know, is the speed of light. The speed of light is the key to uniting space and time. We call this maximum speed "c" in physics. And c is 299,792,458 meters per second. As you know speed is distance over time. If we multiply this speed by time, we get a distance. So now we can convert time in the same equation to distance – distance = c*t. Thus, the equation works by using this conversion factor. This formulation for a 2 dimensional spacetime can be extended to the real 4 dimensional spacetime we live in. And that 4 dimensional geometry is the foundation for understanding General Relativity, with the addition that this spacetime is no longer flat, but can curve and contort. So the math gets complicated in General Relativity. The consequence of a curving spacetime is that this results in gravity. Why do we have only 3 dimensions, why not more? And why not more than one time dimension? First, large spatial dimensions probably don't exist because we would have detected them if they did. And more than one dimension of time could result in closed time-like loops, in other words it would allow travel to the past. This is considered an impossibility because it would break causality. More than 3 spatial dimensions would also likely have fatal consequences. In 1920 Paul Ehrenfest showed that our orbit around the sun would be impossible if we had an additional spatial dimension. Other problems have also been identified, for example the orbit of the electron in atoms would become unstable. #spacetime If we had fewer spatial dimensions, then spacetime would be too simple for life. For example if we had only one spatial dimension, then orbits could not form. Two dimension would also probably be too simple to result in life. →

←

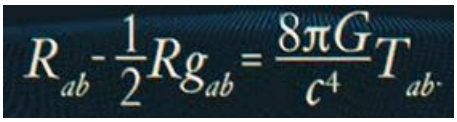
SUMMARY in Czech + coment

What is spacetime? Are space and time the same? Space was treated as nothing, an empty void without matter. In 1908, Hermann Minkowski postulated that time can be considered a 4th dimension along with the three dimensions of space. So it was a simple declaration…then time can also be considered!! as a 3-dimensional artifact, why not, why yes? I have a lot of arguments to defend this vision. (*-*) Spacetime can then be considered a 3+3D Being = environment. Einstein later showed, = declared that this spacetime is a kind of geometry, which can bend and influence the trajectory and flow of objects in time. Einstein showed = presented as a proposal, he simply declared it. No one stoned him for it like I did in 2006 – 2009. Then, for the same freedom of opinion, it is possible to declare (!) that a curved space-

time (e.g., the popular dimples in the net - trampoline) changes the trajectory of an object's movement so that the system owning this object - the rockets **rotates** … https://www.hypothesis-of-universe.com/docs/c/c_009.jpg ; because it copies the dimple, it moves in a curved - rounded space-time. If this is the case, (without stonewalling), then the Observer in his basic system "reads" (arriving photons = informants) from the rotated system time and length intervals (geometrically) deformed, i.e. dilated, and contracted. STR is then a reality not about the dilation of the stretching of the time interval, (and the shortening of the length interval), but ||is the STR about the rotation of the system||. It is an expressed opinion and a truth that on the rocket itself time does not extend at all, there is no dilation there (time runs there at the same pace as on Earth...; and perhaps time runs in the entire universe at the same pace in a "stop-state" across the entire universe. The pace of time changes in the history of the Universe towards the big bang precisely by the "unfolding" of space-time https://www.hypothesis-of-universe.com/docs/c/c_032.gif , i.e. both time separately and length separately), it is only the effect of extension (of the time interval in the projection of the Observer), or shortening of intervals due to the influence of the rotation of the system. No one ages slower on the rocket. It is the effect of "sensing an extended time interval" into an observatory at rest, which is adjusted to rest. Then this finding can also be used to explain redshift, which will also be the effect of system rotation.(!) All three types of redshifts can be explained by system rotation in curved spacetime (local and global). How can space and time be part of the same canvas? Space is measured in meters, while time is measured in seconds. How are these two concepts interchangeable? And why should they be interchangeable? Who/what demands it? https://www.hypothesis-of-universe.com/docs/c/c_012.jpg ; The definition of spacetime is a set of points in space and time, located using 4 numbers. That would be the position in three-dimensional space and time. You can also call these events events. In ordinary Euclidean space, the distance between two points A and B is relatively easily determined. The straight line between them is the shortest path. And it is also obvious that another path from A to B will be longer. If we change one of the coordinates to time, and physicists do this very often!! to "give" people some new idea the math we need is not based on Euclidean geometry, but on Minkowski geometry. → it must be 3+3D → https://www.hypothesis-of-universe.com/docs/c/c_012.jpg The straight line between A and B does not represent distance, but time elapsed between the two events. The straight line represents travel at speed between the two events and is the MAXIMUM duration. For example, in spacetime, if you were to travel a curved path from event A to event B or a zigzag path, then the elapsed time was shorter not in reality, but in the observable it appears to be shorter, only in the observable into which the "projections" are taken compared to the direct time between A and B, because you would be traveling more in space than in. Einstein showed that there is no such thing as absolute time, but that doesn't even have to be shown, but Einstein and everyone else still confuses "time" with "passage of time", but they have to track **pace !!!!! passage of time** → that's the >time< and that's why we have a new formula. But how do you add time and distance when they are completely different units? And why add them? The key is that there is an important conversion factor between time and space that allows us to convert one to the other. And this conversion factor is the maximum speed limit in the universe, so as far as we know, it is the speed of light. O.K. https://www.hypothesis-of-universe.com/docs/c/c_038.jpg c = 1/1 because in such a state it is The speed of light is the key to unifying space and time. In physics, we call this maximum speed "c". And c is 299,792,458 meters per second. The reason is the choice of units, otherwise the Universe

itself chose c = 1 meter*/ 1 sec. The ratio is 8 orders of magnitude different, because we are 8 orders of magnitude more sensitive to the true unit of length than to the unit of time.

As you know, speed is distance in time. If we multiply this speed by time, we get distance. Now we can convert time to distance in the same equation – distance = c*t. So the equation works using this conversion factor. This formulation for 2-dimensional space-time can be extended to the real 4-dimensional space-time in which we live. And this 4-dimensional geometry is a "trick", a "self-deception", because in the true physical reality 3+3D applies, the basis for understanding general relativity, with the fact that this space-time is no longer flat, but can curve and deform. 3+3D space-time can also curve and deform. It is even meaningful to understand that the "brilliant" equation (*) →



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s a scam, a dimensional fraud, because… →

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because physicists fraudulently and knowingly wrongly assigned dimensions to the gravitational constant "G". If they had not done so, they would have found themselves in

“astonishment” that the equation did not fit and would finally understand why Navrátil “substituted” the letter “m“ (mass, weight) for the regular letters “x” and “t”, i.e. for space-time quantities. Now the OTR equation is correct, but it expresses something else, that…that matter is built from the dimensions of the quantities “Length” and “Time” …; here are the ’packages of dimensions’ presenting elementary particles of matter → https://www.hypothesis-of-universe.com/index.php?nav=ea ; So mathematics gets complicated in general relativity. The consequence of curved space-time is that it leads to the emergence of gravity. The consequence of curved space-time is the possibility of warping = packing dimensions, and this leads to elementary particles of matter. In fact, all matter requires just those 6 dimensions. And that's it; there is a model of the structure of matter, as it is in the real universe. https://www.hypothesis-of-universe.com/index.php?nav=e **Why do we have only 3 dimensions, why not more? And why not more than one time dimension?** Because you haven't been interested in it for 110 years. First, large spatial dimensions probably do not exist, what is a "big" dimension (spatial)?? First you talked about extra dimensions, now about a "big" dimension because if they did, we would detect them. And more than one dimension of time could lead to closed time loops, well, is that wrong? In the macro-universe with expanded dimensions, loops will not arise, logically, but in the micro-universe yes, there they make sense for compactification into matter. What do you not like about that?!!! The only flaw is that you have been neglecting this possibility for 110 years and **not investigating it** , in other words, it would allow travel to the past. That's nonsense!!, why should the possibility of traveling to the past arise on Planck scales? Here on micro-scales, by curving dimensions and then collapsing dimensions, a "cursor flow" will occur along the dimension in the opposite direction, but the result is the production of matter, not travel into the past. Didn't you think of that????? There are tens of millions of you today who have studied physics, and all of you have ignored HDV for many years. This is considered impossible because it would violate causality. In the microworld, causality is not violated. More than 3 spatial dimensions would probably also have fatal consequences. Despite this, thousands of physicists have allowed themselves to use them in string theory, 40 years, for hundreds of millions of money, and no one has stopped them. Not even my HDV, because no one reads it. (and no one has given me a few money in a grant so that I could pay a few experts who could help catch errors in HDV. In 1920 **Paul Ehrenfest** showed that our orbit around the Sun would be impossible if we had another spatial dimension. Other problems were identified, for example the orbit of an electron in atoms would become unstable. *#spacetime*. This is not certain if nuclear experts also included combinations of curved time dimensions. I think fusion also has a problem precisely because the Heisenberg uncertainty principle must be corrected by the factor Δt/t, which the Sun and large stars do when they form (they wrap the time dimension Δt/t in plasma), but “man” doesn’t do that at CERN…, fusion won’t work for more than a second… If we had fewer spatial dimensions, then spacetime would be too simple for life. For example, if we had only one spatial dimension, then orbits could not form. Two dimensions would probably also be too simple for life to arise.

0:00

(01)- This video is brought to you by Brilliant. Click the link in the description to sign up for free and support this channel. What is the most important concept in physics? Quantum mechanics? I would say it's space-time. !! O.K. Without it, we would have no stage for all the

physics we know to act upon. It would be like an artist with all the colors of paint, brushes of all shapes and sizes, but nothing to paint on, and so there would be no masterpiece. Just as an artist is nothing without a canvas or an actor is just another person without a stage, we must have some place where physics can develop. That place is space-time. Space was once thought to be nothing, just an empty void, a vacuum without matter. Then in 1908 |came Hermann Minkowski with the idea that time could be considered a 4th dimension along with the three dimensions of space. So even HDV with the idea of 3+3 dimensions **can be considere** as a stage for all physics. And Einstein later **showed**, showed what? He just declared it…, that this spacetime is a kind of geometry that can bend and twist, which affects the trajectory and the passage of time of objects.

1:03

We take it for granted because it's all around us, ever-present, like a fish takes for granted the water it swims in. But is there a thing all around us, this all-important, existential canvas without which the universe and we would not exist? And how can space and time be part of the same canvas? Space is measured in meters and feet, while time is measured in seconds and minutes. How are the two interchangeable? It seems that doesn't make sense. It only seems… And why do we have only one dimension of time and three dimensions of space? Why not 2, 4 or 5 spatial dimensions and more than 1 time dimension? Because no one has really studied it, so… I'll try to explain it intuitively. Stay tuned, because you don't want to miss this. It's coming right now... The definition of spacetime is a set of points in space and time, located with 4 numbers. Why not 6 numbers??

2:02

This would be a location in 3-dimensional space, x, y, and z, and time. You can also call these events. So if you had an event where you were meeting someone, you could say something like Meet me at the building on the corner of Fifth Avenue and Broadway, on the 6th floor. And of course you would have to tell them what time it was, otherwise the meeting wouldn't have happened. The problem isn't understanding what space and time are. Right? We can intuitively understand the three dimensions of space. It's all around us. We can move forward and backward, left and right, and up and down. And we can understand time by the ticking of our clocks and the changes that we can observe over time. But the problem is understanding how these two seemingly completely different concepts can be connected into a four-dimensional continuum called spacetime. Why is this a problem? That's not intuitive at all. Space is measured in meters and feet, time is measured in seconds and minutes, and so on. A pig is measured by its flesh and bones, and a tree is measured by its wood and leaves, and…and everything is measured in various "measurable **tools**", what's the point?

3:01 It seems that these are two completely different things. ((Maybe time is anti-length and length is anti-time)). How can distance and time be interchangeable? Why should I/must I confuse meat and wood? And how can they both be part of the same thing? They are both part of Nature, why not? To answer this question intuitively, let's compare the geometry of spacetime to the geometry of space, because space is something we experience every day and can identify with. ||For simplicity|| let's look at only two spatial dimensions. Are you simplifying just because you can't fit a third dimension on paper… is that necessary? Note that what I'm going to show here also works for three dimensions, but the math is more complicated. In regular Euclidean space, the distance between two points A and B is relatively easy to find out. All we need to know are the coordinates in the X and Y directions. On paper. Knowing this, we can use the Pythagorean theorem to do a simple calculation. x^2

+ y^2 = z^2. O.K. The distance Z is the shortest path from A to B. And it is also obvious that any other path from A to B will be longer. So for example, if we take a curved path or a zigzag path from A to B, that path will be longer than Z. O.K. But here you choose c . t = z, so c = z/t ; so $(xt)^2 + (yt)^2 = z^2$ so why do you do that?

4:06

That's pretty simple. Now let's look at spacetime. To make it as similar as possible to a 2D model, we'll use two dimensions again. But this time we'll use one spatial dimension, X, and the second dimension will be time, t. if you need to examine the meat and bones in a pigsty, why do you want to take wood with you? This time A and B are not just points in space, but also in time, that's right, sometimes you only need a meter to examine the line A-B, sometimes you also need time, i.e. seconds. What's complicated about that? If the continuum is 3+3D, we simply evaluate the line A-B in all dimensions, e.g. $x_1 = 7$; $x_2 = 0$; $x_3 = 0$; $t_1 = 0$; $t_2 = 0$; $t_3 = 0$..., so you can think of them as events rather than just points. The mathematics we **?** have to use here is not based on Euclidean geometry, but on Minkowski geometry. I can base the mathematics on anything. The mathematics that is more "flexible" will stick. There are a few big differences. The line between A and B does not represent distance, but the time that has passed between these two events.? Why?...why doesn't a line segment represent distance, an interval of length, and must represent time, an interval of time? That's bad logic. We'll call this elapsed time E. Why E when everyone everywhere uses the letter "t" for time and its intervals!! A straight line represents travel at a constant speed between two events. You've somehow switched to travel, what does the line A-B have to do with travel, even though we evaluated it not only in meters, but also in terms of time?? You might be thinking, well, to find out the elapsed time, all you have to do is subtract the time I left at A from the time I arrived at B. Isn't that the elapsed time?

5:05

This is where all the ideas of spacetime and special relativity take a counterintuitive turn. The answer is no, you can't just subtract the time you left from the time you arrived to find the elapsed time. Why? Because you have to remember that time is relative. Nonsense. First of all, you don't know what "relative" is, and secondly, you're not judging time, but the rate of time, and that rate is the same in the local environment. If an object in the x, y, z frame (which extends from us, from a point called zero, to infinity, to the last galaxy) is moving, then it is moving at a non-zero velocity with its own x', y', z' frame. The frame set to rest is not moving. So in this Observer frame, all objects are moving at a non-zero velocity. So what's the point of relative time? In the x, y, z system (which does not expand or chirp), time passes at the same rate $t_1 = t_2 = t_3$ for both the Observer and the Object in motion. The joke of relativity is that the rate of length expansion or rate of time passage changes (***on the object***) and only for the Observer at rest. The Observer can sometimes observe something that is distorted (by relativity) or lengthened (by relativity) for him, and yet in the observed place, i.e. the x´, y´, z´ system, nothing relative happens. Unlike Newton, who thought that time is absolute, absolute is TIME as a quantity … which also has dimensions like the quantity Length, has 3 dimensions. However, the "rate of time passage" which is the observed "speed" of cutting off time intervals is not absolute. The absolute fact that c = 1/1 will help. Einstein showed that this is not the case. Newton was wrong about this. Einstein was right. The ticking of a clock changes with speed. Wrong! The ticking of a clock must not change, a clock is a mechanism artificially set/built/constructed for some **pace (!)** cutting of time intervals. Then time, i.e. the pace of time passing changes. Clocks do not, but time does. Time passes **differently** for

everyone who moves at a different speed than for someone who stands still. No. No. Time, i.e. the pace of time passing = cut intervals on the time dimension, is the same for everyone throughout the Universe, (under identical conditions), but the OBSERVER observes that time = pace of time passing (cutting intervals on the time dimension) on objects that move away from him, passes at a different pace. Summary: A standing Observer (i.e., brought to rest) o b s e r v e s on moving objects (from him) a different rate of time than he himself has, while **on those objects themselves** the rate of time does not change. So this elapsed time will be different, it will not be! It is just that the Observer observes that the elapsed time, that time, will be different… because traveling from A to B requires speed in space. This is also a false reason. The reason for the different rate of time is/will be the rate of rotation of the systems. If if someone simply stood at A (and this condition-requirement must be determined in advance = The observer is passed to rest. We know that rest = no movement, is relative, not time = the rate of passage of time. The rate of passage is different, but never zero. Rest or no movement cannot be achieved without passing to rest, and he moved only in time, but not in space, was passed to rest, then yes, (!) it is enough to subtract the time difference between A and B and get the elapsed time. But not in the case when it was about traveling through space in order to get from point A to point

6:02

B. ? Umm… Given what I just said, you will correctly assume that Pythagorean theorem cannot work here. Of course it cannot, because you have coupled "x" with "t" to c.t = x. … and you have made Pythagoras like this: $(xt)^2 + (yt)^2 = z^2$. So x squared plus t squared does not really equal E squared. Watch out, watch out, you have sucked that blue theorem out of your finger and you are also giving the elapsed time = time a minus sign: $x^2 + t^2 \neq -t^2$. Then that is nonsense, not Pythagoras theorem. The formula that works here is actually only slightly different. It is this: E, or elapsed time (or duration) squared, equals t squared MINUS X squared. The minus sign makes a huge difference. And why should Pythagoras be (for you) → E^2 = t^2 – x^2 ??? with $E^2 = -t^2$. This formula basically shows that the more one travels in space, here represented by X, in any given time, the shorter the elapsed time. It seems that time and space have a kind of inverse relationship. So while in Euclidean space a straight line is the shortest distance. In Minkowski spacetime the line between A and B has the LONGEST duration=time. The more you move in space, the less you move in time. In STR it is the other way around. I would have to study the whole passage thoroughly. I don't want to, so no comment for now. And the less you move in space, the more you move in time. So that means that if an object moves 7 centimeters from a "fixed Observer" it takes almost an eternity in time, right? … ?

7:01

So, for example, if you were to take a curved path in space-time from event A to event B, or a zigzag path, then the elapsed time would be less compared to a straight line between A and B, because you would be traveling more in space than in time. This statement goes back to STR. So for this statement here, it is true that the statement said "stationary Observer". In STR, it is true that time dilation increases on a moving object. I have a different explanation: frame rotation. This can be seen in the equation we saw earlier, but we can illustrate it with a simple example. Let's say you had a twin brother or sister who stayed on Earth while you traveled a long distance in space, at some speed, and they returned to Earth. You would age less because you would have traveled more in space during the same time that your twin stayed on Earth. Less time would have passed for you than your twin. I guess you have a lot of questions, so

let's go over some of them. First, you might ask where this formula comes from. It comes from Minkowski. For just two dimensions, the math isn't that difficult, and I have a link in the description if you want to see how it's derived. Another question you might have is what is the difference between the duration of "E"
8:01
and "t" the time coordinate. So E, the duration, would be what a person traveling from A to B would measure on their wristwatch or clock. The lowercase "t" is the time coordinate of the system. It's like universal time. There really is no such thing as time. Time is not time, time is a quantity, time is then the number of intervals that a moving object cuts across the time dimension. It is a human invention, *time* nor is the *quantity time* a human invention, (both time and time existed before the "creation" of man, but if it helps, you can think of it as time measured by someone standing perfectly still in space. No one stands perfectly still in space… In Newtonian physics, before relativity, the time coordinates t and E elapsed time were considered to be exactly the same. As stated from an observatory that "stands in view of the Universe". This is an outdated concept of absolute time. Einstein showed that there is no such thing as absolute time, and so we have a new formulation. Now perhaps the biggest question you might have is how the heck do you add time and distance together, since the units are completely different, meters vs. seconds. Well, that's a great question! And that's what I've been working to get to. Where? The key is that there is an important **conversion factor** between time and space, or the conversion factor between melons and plums, right? which
9:03
allows us to convert one to the other. photo-snapshot →

$$R_{\mu\nu} - \frac{1}{2} R g_{\mu\nu} = \frac{8\pi G}{c^4} T_{\mu\nu}$$

And that conversion factor is, drum roll please, the maximum speed limit of the universe. So apparently the conversion factor **conversion factor** between spacetime (on the left in the equation) and matter (on the right in the equation) for you will be/is **8PíG/c4** , otherwise you wouldn't get dimensional equality – correctness – balance … you probably like scams and frauds, right?..., otherwise you wouldn't assign dimensions to the gravitational constant "G", because "G" is just a "bare number" (!)… it's not a "thing", nor a "caterpillar" or a "tin pan" flying through the universe, it's not even a "thought", it's just a number. And…and as you can see, we're at the fundamental problem I'm asking about

The question and problem of the gravitational constant – CZ

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physicists for 20 years: ***Why do physicists have to = want to add dimensions to the number "G"???*** Or add some kind of conversion factors, some kind of transfer factors to "G"…Well, Mr. Navrátil, they have to because in the equation "potatoes" would not equal "oranges". For 110 years, no physicist has asked whether it would not be possible to substitute the letters "**x**" – length, **"t"** – time for the letter $T_{\mu\nu}$ (and thus **"m"** = mass/weight). But, Mr. Navrátil, that is not possible, although you would solve the dimensional equality/balance, you would produce mass from the dimensions of two basic quantities, and that is not possible? How?...; It works, like this: https://www.hypothesis-of-universe.com/index.php?nav=e ; https://www.hypothesis-of-universe.com/index.php?nav=ea etc. etc. And that speed limit, as far as we know, is the speed of light. The speed of light is the key to unifying space and time. Great. And when you "unite" them, you get >´potato-orange??´ < or >´caterpillar-cake´< ?? The quantity "Length" and the quantity "Time" will remain separate quantities as 3+3D Being. https://www.hypothesis-of-universe.com/docs/c/c_486.jpg ; In physics, we call this maximum speed "c". And c is 299,792,458 meters per second. As you know, speed is distance in time. If we multiply this speed by time, we get distance. So now we can convert time to distance in the same equation – distance = c*t. So the equation works using this conversion factor. But the Universe is not just an equation. Even an equation is a rare fact in the Universe, mostly there are inequalities, inequalities. And in addition, I am presenting a vision about the Principle of alternating symmetries with asymmetries – without it there would be no

genesis and dynamic transformations. https://www.hypothesis-of-universe.com/docs/g/g_073.pdf ;Note that this speed can also be more conveniently written as 1 light second per second. So converting all distances to light seconds instead of meters can make it easier
10:00
math when using seconds and meters for our units. Now let's go back to the graph and look at some of its profound implications. This simple formulation for 2-dimensional spacetime can be extended to the real ?? 4-dimensional spacetime that we live in. **Real** is a 3+3-dimensional spacetime. Unfortunately, physicists are not interested in exploring such a spacetime. And that 4-dimensional geometry is the basis for understanding General Relativity, with the addition that this spacetime is no longer flat, but can curve and twist. So the math gets complicated pretty quickly in General Relativity. But one of the consequences of the curvature of spacetime is that it leads to the phenomenon of gravity. Gravity also results in time dilation, which means that time runs a little slower for objects near massive bodies like Earth, where gravity is higher, compared to those far out in space. And there time runs infinitely fast, huh ??? https://www.hypothesis-of-universe.com/docs/aa/aa_471.pdf ; But this time dilation effect **due to gravity** is weaker for relatively few mass objects like the Earth than the time dilation effect **due to high speeds**.
11:02
Spacetime is a four-dimensional phase for physics, which has existential significance. You may be asking, why do we have only 3 dimensions, why not 4 or 5 or 6 or more spatial dimensions?This question is funny, once most physicists flock to a theory that needs extra dimensions, and they rejoice over it, and then comes a period in which physicists reject, condemn, do not believe in multi-dimensionality…; I stand on the position, a model of the Universe of two physical quantities, Length and Time, which have 3+3 physical dimensions and to them the Universe has other dimensions (extra), which are mathematical, for example https://www.hypothesis-of-universe.com/docs/eb/eb_002.pdf ; (for multi-curved dimensions and which are needed for the construction of matter, for example https://www.hypothesis-of-universe.com/docs/eb/eb_004.pdf ; https://www.hypothesis-of-universe.com/docs/ea/ea_017.pdf ; And while we're at it, why not more than one time dimension? !!! Well, first of all, the other large spatial dimensions probably ha-ha, probably there are no devils or fairies… they don't exist, because we would detect them if they existed. That's stupid evidence. Everything that we didn't detect in the past didn't exist, right, and suddenly it exists because we now have better observation techniques. You don't observe the time dimension because you don't observe it.
česky
Time is the least studied "thing" in physics and reality →
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And more than one dimension of time could result in closed time loops, Well, is that wrong? In quantum mechanics, in the HDV model, loops, packages of dimensions, all physical dimensions are necessary to build matter. https://www.hypothesis-of-universe.com/index.php?nav=eb ; in other words, it would allow travel to the past. In the microworld, common and real… ; Matter built in the style of warping and packing dimensions at short intervals, so time "runs with the opposite arrow" in it. Why not? Well, because you haven't considered it yet, studied it, and read HDV. That is considered impossible, in the macroworld, yes, impossible… because it would violate causality. So, for example, it would allow you to travel to the past and kill your father so that you would never be born, so you would never be able to travel to the past. That would create paradoxes. So it is not considered possible. There are also **studies** that show that any number of dimensions other than the 4 we live in would either lead to no life or an unstable universe. The studies are wrong. (!)
12:03
If we didn't have at least one dimension of time, nothing would develop, nothing would change, so life couldn't exist. So we know that we need a time dimension. And we don't know (we noob extra thinkers with 3x degrees) that we need at least 3 time dimensions. I built all elementary particles that exist from 3+3 dimensions, even a few particles that you haven't discovered yet, see https://www.hypothesis-of-universe.com/docs/ea/ea_006.pdf ; But what if we had more than 3 large dimensions? As it turns out, this would probably have fatal consequences. In a 1917 paper, Austrian physicist Paul Ehrenfest showed that if we had even one extra dimension, gravity would decrease by a factor of 8 when the distance from a planet to its star doubled. This would cause even the slightest deviation in a planet's orbit to either spiral out of the solar system or meet a fiery death by colliding with a star. Other problems have been identified, such as the electron's orbit in atoms becoming unstable. If we had fewer spatial dimensions, then spacetime would be too simple for life. For example, if we had only one spatial dimension, then orbits could not form. Two dimensions would also probably be too simple to result in life.
13:03
The table here summarizes these ideas. This leads us to the conclusion that, while it may sound like an anthropic idea, it seems that spacetime must consist of exactly 3 spatial plus 1 time dimensions, because if it were otherwise, we wouldn't exist. So count your lucky stars

that we happen to live in just such a universe. If you've watched this video this far, you'll realize that I've tried to simplify the concept of spacetime by talking about it in the context of special relativity. And as you can probably guess, there's a lot more to special relativity. If you want to understand this topic in detail, there's a great course on Brilliant.org, our sponsor today, called Special Relativity. This hands-on, 18-lesson course will help you not only understand the basics, but also many advanced concepts. It's part of Brilliant's Science learning journey, which includes ten courses at five different levels. The great thing about the Special Relativity course is that it starts with the history 14:03 of how it was postulated and the basic principles that form the basis. So before we get into advanced concepts like energy and momentum, it starts by trying to build an intuition for the concept by looking at the old concept of the luminescent aether, the propagation of light, and the relative motion of objects. As usual, Brilliant makes learning fun with graphics, interactive quizzes, and hands-on simulations. This kind of hands-on, interactive learning is, in my opinion, the best way to learn new things and retain information long-term. Brilliant has something for everyone, with thousands of lessons in various STEM courses, and new content is added every month! All you need is 30 minutes a day to not only develop your advanced science knowledge, but also your scientific thinking skills. **Brilliant** is having a special offer right now for **Arvin Ashe** viewers - get started for free for a full 30 days by clicking the link in the description.
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the first 200 people will even get a 20% discount on their subscription. I recommend you give it a try. I think you have a lot to gain. In addition to Brilliant, I would like to thank my Patreon supporters. Your generosity helps pay for these animations. I really appreciate it. And if you like our videos, subscribe so you can be notified when we post new videos. What is your idea of space-time? **Let me know in the comments**. I would let you know, but the furious haters who are following me have asked the //commander// of YouTube to block me. https://www.hypothesis-of-universe.com/docs/aa/aa_366.jpg They have done it twice already. Is there anyone who can help me unblock my access to YouTube.?
15:23
See you in the next video, my friend.
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JN, 16.05.2025

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