https://www.youtube.com/watch?v=wwSzpaTHyS8

Did The Future Already Happen? - The Paradox of Time

Už nastala budoucnost? - Paradox času

(+ my comment in red)

0:02

(01)- Do your past, present and future all exist right now? Are you watching this video, being born and lying on your deathbed at this very moment? Surprisingly, the answer could be yes. But how can that be? What does that even mean? How does time work? Imagine the universe like a child painting pictures on paper. Each picture shows everything that's happening in the universe in a single moment. With each new moment, all kinds of things occur everywhere – people are born and die, galactic civilizations expand, you miss the bus – and our universe-kid makes a new picture that replaces the old one. In this way you get something like a movie – only the moment we're in right now is real. The past is what happened before, now it's gone. The future is still to come and hasn't been drawn yet. This is kind of how time feels, right? Each moment being replaced by the next one. The past is far behind us, the future doesn't exist. But what if time is something else? What if the universe-kid has already finished all its drawings and stacks them on top of each other? This way we get a block – a block of time that contains the whole history of the universe. All moments that have ever existed or will ever exist. But in this block, in this stack of moments, the past, the present and the future are equally real and exist at the same time. This feels wrong – the only things that we perceive as real are those things happening now. How can the past and future be real right now? The problem is that according to the theory of relativity, they kind of have to be. Heavily simplified, relativity says that time and space are not separated, but one connected spacetime. When you move through space, you are also moving through the block. This means time passes differently for different people, depending on how they move through space relative to each other. And this also means that what someone perceives as "now" is a certain cut along the block – a cut that will depend on how fast they are moving. So what you think is "now" is really only your now – there are many different "nows" in the universe and all of them are equally real. This also means there is no universal past or future. Ok. This is a lot – how does this work? Imagine three alien spaceships a million light years away. The first one just hovers in space, not moving relative to you. You both experience the same "now", the same present. If you had a magical instantaneous internet connection, you could do a video call right now and chat about alien things. The second spaceship is flying away from us at 30 km/s, about 3 times faster than a human rocket. It is moving differently through the block of time than you are, which means its "now" is different from yours. With the magical internet, the aliens can talk to your ancestors in 1924, when humanity was discovering the first galaxies outside the Milky Way. The third spaceship wants to visit Earth and is flying towards you at 30 km/s, moving at the opposite angle of the second ship through the block of time. It experiences yet another "now" – with the magical internet, the aliens can talk to your descendants in the year 2124, when humanity has already built cities on Mars and Venus. Ok, so we have three different "nows" – so which one is correct? Well, that's the problem. Relativity is based on one powerful principle – cosmic democracy: the fact that the point of view of all observers in the universe

is equally valid. All those “nows” have to be equally real. But if this is the case, your past, present and your future all have to exist at the same time, right now! Because for the different aliens, they all happen in their present. This means that the distinction between the past, the present and the future is an illusion. The universe is not a bunch of things evolving through time, like in a movie – but a static block in which the past, the present and the future all coexist and are real. How can that be? Well, think about a galaxy outside the observable universe, too far away to ever visit or see. But even if you can’t get there and don’t see it, it is still real. The future might be the same! But if the past is not far behind us and the future actually exists, then… there is no “movie”. Things don’t happen in the universe. The universe just “is” – like a frozen block of dead, cosmic ice, with everything that will ever happen already written and decided. Is the Future Already Written? If all times coexist and are equally real, then the future has to be already written. But that’s not how you experience things. It feels like you can mold your future with your decisions. It really feels like you're free to choose to stop watching YouTube to not miss the bus. But if the future is set in stone, …….

(01)- Does your past, present and future exist right now? Are you watching this video, being born and lying on your death bed right now? Surprisingly, the answer might be yes. But how can that be? What does that even mean? How does time work? **Imagine the universe as** a child drawing pictures on paper. **Imagine the universe differently than the author's child**. Imagine that the universe is a "pad" =a platform of two quantities Length and Time= and that both have three dimensions... **3+3D space-time**. And in this stoic "yarn" everything happens by means of """"changes in the curvatures of those dimensions""""", can you imagine? OK. In other words, there is a Stoic space-time around us and in it "float (!) changes in matter (chemistry, biology) and changes in physical fields" and... and as they float they cut intervals on those stationary dimensions... they run along dimensions, or they change the configuration of package packaging dimensions = mass. And that is the flow-flow of time and the flow of length contractions, as well as the transformation of matter in interactional changes in the microworld (four forces) and in the macroworld of the gravity of large bodies. - - It's not wrong anymore, or is it? Which one? Each image shows everything happening in the universe at a single moment. ??? **With each new moment** all kinds of things happen everywhere - people are born and die, galactic civilizations expand, you miss the bus - and our space child creates a new image to replace the old one. **With every new moment** everywhere in space on three time dimensions, he moved the "cursor" and cut the interval. With each passing moment, everything moved "across the dimension" (time and length). Shift means movement = change. Changing what?, well, the curvature of dimensions within matter (QM) and dimensions in gravitational fields in the macroworld (OTR). In this way you get something like a movie - only the moment we are in is real. The past is what happened before, now it's gone. The future is yet to come and has not yet been drawn. That's how he perceives time, isn't it? O.K. Each moment is replaced by another. (move the cursor everywhere in space to cut different (!) intervals) The past is far behind us, the future does not exist. The future exists, it just "hasn't been yet". But what if time is something else? What if the space child has already finished all his drawings and stacked them on top of each other? In this way, we get a block - a block of time that contains the entire history of the universe. All the moments that ever existed or will exist. Not “in” but “on”… But in this block, in this mass of moments, past, present and future are equally real and exist at the same time. That's wrong - the only

things we perceive as real are the ones happening right now. Real there are also the past ones, they just aren't on the table "right now"...
How can the past and the future be real right now? The problem is that, according to the theory of relativity, somehow it has to be. Simply put, the theory of relativity says that time and space are not separate, but one connected space-time. O.K. When you move a space, you also move a block. This means that time flows differently for different people depending on how they move through space relative to each other. Well, well, well ?? And that also means that what someone perceives as "now" is a certain slice along the block - a slice that will depend on how fast it's moving. So what you think is "now" is really only your now O.K. - there are many different "nows" O.K. in the universe, and they are all equally real. O.K. This also means that there is no universal past or future. OK OK. That's a lot - how does it work? Imagine three alien spaceships a million light years away. The first one just floats in spacetime and doesn't move relative to you. (you are both moving at the same speed relative to each other, not relative to the environment you are in). You both experience the same "now", the same presence. If you had a magical instant internet connection, you could video call and chat about alien stuff right now. The second spaceship flies away from us at a speed of 30 km/s, which is about 3 times faster than a human rocket. He moves through the block of time differently than you, which means his "now" is different from yours. O.K. With the magical internet, aliens can talk to your ancestors in 1924, when humanity was discovering the first galaxies outside the Milky Way. A third spaceship wants to visit Earth and is flying toward you at 30 km/s, moving at the opposite angle to the second ship in a block of time. For three objects is already required choose the system **x, y, z, t_1, t_2, t_3** observer, the basic system and fit it to rest. (if that's even possible), (**$m_1.v_1 \neq m_2.v_2 \neq m_3.v_3$**). Experiencing another "now" - with a magical internet, aliens can talk to your descendants in 2124, when humanity has already built cities on Mars and Venus. Okay, so we have three different "nows" - so which one is correct? All, it's three cuts across the universe for "three now". Well, that's the problem. Why Relativity is based on one powerful principle - cosmic democracy: the fact that the point of view of all observers in the universe is equally valid. Well, isn't he? All these "nows" must be equally real. Everyone has "nows" that don't match each other huh?, that's undemocratic? But if that's the case, your past, present and future must exist at the same time, right now! Can't be shoved into "one slice" of space in an "everything now" universe. One slice through the entire universe will "cut through" the various sizes of the age of that location in the slice. The speed of time passing from the big bang to the >spherical volume< is not the same, time flows differently in all directions, at a different pace, in a galaxy it is different, in a neutron star it is different see potential levels, inside a black hole it is different, and in intergalactic space the pace is the passage of time is also different. How do you consider cramming all the "same now" into some same cut???!!! Because for different aliens, they all take place in their presence. Well, one can make a "cut" through the entire universe in "stop-time" and "stop-configuration of space and matter"... it is possible. Then it can be evaluated: is the age the same everywhere?..? Is the rate of passage of time the same everywhere?..?, is the density of matter the same everywhere?..? This means that the difference between past, present and future is an illusion. The universe is not a bunch of things evolving in time like in a movie - but a static block in which the past, present and future all co-exist that's kind of a crazy idea
and they are real. How can that be? Well, think of a galaxy outside the observable universe, too far away to ever visit or see. But even if you can't get there and see it, it's still real. The

future can be the same! But if the past is not far behind us and the future really exists, then... there is no "movie". Things don't happen in space. Things = changes = events = transformations "happen" in time, in the expansion=unpacking of time and in expanding space . We do not observe the fact that space expands here on earth around us (it is by 8 orders of magnitude ""slower""), but that time is "expanding" (flowing into the future from the Big Bang to here t = age = ***t_w = 4.4937756 . 10^{17} sec. = 14.24 billion years + Δt = increments of time***, which runs around us every day, we observe it 8 orders of magnitude more sensitively than the expansion of a block of flats). The universe simply "is" - like a frozen block of dead, cosmic ice, with everything that will ever happen already written and decided. Is the future already written? If all times co-exist → here you can see the basis of the author's bad reasoning… and they are equally real, then the future must already be written. But that's not how you experience things. You feel that you can shape your future with your decisions. You really feel like you can freely decide to stop watching YouTube so you don't miss the bus. But if the future is set in stone, you use the word "if" too often…

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(02)- you can't "decide" anything. So are your choices an illusion? Well… maybe. Maybe your free will is a mirage. And maybe you missing the bus was already predetermined at the Big Bang, so feel free to continue watching. Except...quantum stuff is ruining everything again. Quantum processes can't be predicted, not even in principle. Not because we are silly and don't know how to do it – according to quantum physics, quantum particles are intrinsically random. For example, if you have a radioactive atom, it could decay at any moment, in the next second or in the next million years. We can calculate the probability that it will decay tomorrow, but no oracle in the universe will ever be able to tell you with absolute certainty if it will do so or not. But quantum particles can change the world. Imagine a radioactive element randomly decays and causes a genetic mutation in a nearby mammal. And then many generations later that mutation has led to a weird mix of duck and mammal that makes no sense. Or the atom decays a day later and the weird creature will never exist. If quantum stuff is really uncertain, the future can't be set in stone. But if the future is an untold story, it can't be real in the same way as the past is. So what happens when uncertain things, like the decay of our atom, become real? Is that moment the present? Is this "now"? But before we saw that cosmic democracy makes it impossible to define an absolute "now". What's going on here? It turns out that for every individual object – you, an alien, an atom – the past, the present and the future are always well defined. Your death will always happen after your birth – never before, and never at the same time. Now you are clearly between your birth and your death. So for you at least, "now" makes perfect senseIf we don't play tricks like going to the other side of the universe and using aliens in funny ways to find out what "now" means, things again start to look ordered and nice, and individual "nows" seem to exist. Can we do something with them? Let's return to our block universe. Maybe the block does not contain the future – and maybe we just imagined it wrong. Maybe the block is just the past, and a thin layer on the surface is the present. That surface is not smooth, but bumpy and uneven. It's been made by joining countless individual "nows" – each experienced by someone or something in the universe, each equally real and valid. And all observers do their bit, so cosmic democracy is still true. As new things happen and uncertain things become certain –radioactive atoms decay, new species of mammals arise, people miss the bus– the border moves upward, creating new time in the universe. Instead of a frozen block of time with a future that has already been written, the block is

growing and things happen. You can again decide your future! Maybe leave earlier so you won't miss the bus! Let's recap. We started with time as a movie – one "now" after another, where only the current "now" was real. Then we found out that because of relativity there are multiple "nows", all of them real somehow – which could mean that we are living in a frozen block universe where things don't happen and you don't really have free will. And we ended up with a kind of growing block universe, where time passes and the future is open. So which is correct? What is real? The present? The past? Are the dinosaurs as real as you are right now? What do the aliens on the other corner of the universe think about all this? To be honest, no one knows. What we've learned are two possibilities to describe time, but they're not the only ones. Some scientists think that the idea of "now" only makes sense near you, but not in the universe as a whole. Others think that time itself doesn't even exist – that the whole concept is an illusion of our human mind. And others think that time does exist, but that it's not a fundamental feature of the universe – rather, time may be something that emerges from a deeper level of reality, just like heat emerges from the motion of individual molecules or life emerges from the interactions of lifeless proteins. We could go on, but… aren't you about to miss the bus? The concept of time is abstract and elusive, possibly beyond complete human comprehension. Fortunately, there's a vast world of things we do understand about the universe that you can explore right now — thanks to our friends at Brilliant.org. Brilliant has thousands of bite-sized, hands-on lessons in science, math, technology, and beyond. Their latest course, "Introduction to Probability," offers a practical guide to interpreting the world. You'll master the tools of chance, risk and prediction while learning to model real-world situations and running simulations of everything from election results to who will win the next World Cup. They even have a
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(02)- you can't "decide" anything. So are your choices an illusion? In a very complex system of configurations of matter and space-time, especially in the macroworld of interactions, "chosen and unchosen" changes are possible. Well, maybe. Maybe your free will is a mirage. And maybe you missed the bus, it was already predestined at the big bang, that's slapping the water.. so feel free to continue watching. Except...quantum stuff destroys everything again. Quantum processes cannot be predicted, not even in principle. That's bullshit. The outcomes of quantum processes cannot be predicted, but quantum processes can be predicted… Not because we are stupid and don't know how - according to quantum physics, quantum particles are intrinsically random. For example, if you have a radioactive atom, it can decay at any time, in the next second or in the next million years. We can calculate the probability that it will fall apart tomorrow, but no oracle in the universe will ever be able to tell you with absolute certainty whether it will or not. But quantum particles can change the world. Imagine that a radioactive element accidentally decays and causes a genetic mutation in a nearby mammal. And many generations later, this mutation resulted in a strange mixture of duck and mammal that makes no sense. Or the atom will disintegrate a day later and the strange creature will never exist. If quantum things are really uncertain, the future cannot be set in stone. But if the future is an untold story, it cannot be ||real|| in the same way as the past. Why are you mixing up "reality"? In a given 'stop-state' reality is always real, isn't it?!!.. So what happens when uncertain things like the disintegration of our atom become reality? Is the moment present? Is it "now"? But before we saw that cosmic democracy makes it impossible to define an absolute "now". Of course. There is no absolute "now," even if cosmic

democracy made it possible. Why do you want to "define" so-and-so? What's going on there? It turns out that for every single object—you, an alien, an atom—the past, present, and future are always well defined. Your death always happens after your birth - never before and never at the same time. Now you are clearly between your birth and death. So at least "now" makes perfect sense to you, unless we play tricks like going to the other side of space and using aliens in a funny way to figure out what "now" means, things will start looking up again orderly and nice. and there seem to be individual "nows". Can we do something about them? Let's go back to our block universe. Maybe that the block doesn't contain the future - and maybe we just imagined it wrong. In the micro world of interactions (says Prof. Kulhánek) there is no past or future. The flow of time there is >omnidirectional< Why? Well, because matter itself is "a wrapped, packed cluster of twisted twisted dimensions 3+3).Maybe the block is just the past and the thin layer on the surface is the present. That surface is not smooth, but bumpy and uneven. It was created by the amalgamation of countless individual "nows" - each experienced by someone or something in the universe, each equally real and valid. And all observers do their part, so cosmic democracy still applies. As new things happen and uncertain things become certain—radioactive atoms decay, new species of mammals arise, humans miss the bus—the boundary moves up, creating a new time new time in the universe. Instead of a frozen block of time with the future already written, the block grows and things happen. You can decide your future again! Maybe leave early so you don't miss the bus! Let's recap. We started with time as a movie - one 'now' after another now where only the present 'now' was real. Err…, "all nows" are real, just not in the same place at once. Then we found out that due to relativity there are multiple "nows"?, all somehow real - which could mean , that we live in a frozen blocky universe where things don't happen and you don't really have free will. And we ended up with a kind of growing block universe, where time passes and the future is open. So which one is correct? what is real? Real is everything that is physically real (Hell with devils is not real…)
Presence? Past? Are dinosaurs as real as you? What do the aliens on the other side of the universe think about all this? To be honest, no one knows. What we have learned are two ways to describe time, but they are not the only ones. Some scientists believe that the idea of "now" only makes sense in your surroundings, but not in the universe as a whole. Others think that time itself doesn't even exist—that the whole concept is an illusion of our human minds. And others think that time does exist, but that it is not a fundamental feature of the universe - time may rather be something that emerges from a deeper level of reality, sounds mysterious, but I think reality will be more ordinary: TIME is a quantity of physical Being, and has three dimensions. The dimensions unfold together with the space and this manifests in observably as a flow, the passage of time..., from another point of view, and the same means the passage of time as the shift (movement) of material objects along the stoic time dimension, ...our earth "shifts" after an ellipse around the sun and this can be expressed in a system of three axes **$x\text{-}t_1$; $y\text{-}t_2$; $z\text{-}t_3$** with 3+3 dimensions, http://www.hypothesis-of-universe.com/docs/c/c_486.jpg displacement, where it is difficult to assess on a global scale how much the displacement is on the **x, y axis , z**, if we are in a sphere of $R_v = 1.3471999 \cdot 10^{26}$ m - the distance to the limits of the visible universe and the increments are for a racing car at Monza (the driving direction will be the "x" axis) **$\Delta x = 110m$** ; **$\Delta y = 0.005m$; $\Delta z = 0.005m$ …** and the aging of the Ferrari car together with the entire universe at the age as of today **$t = t_w = 4.4937756 \cdot 10^{17}$ sec. = 14.24 billion years plus those increments in the**

x-axis ≡ Δt_1 = 3.6 sec. ; y ≡ Δt_2 = 0.000000036 sec. ; z ≡ Δt_3 = 0.000000036 sec. ; and since human sensitivity to intervals of length is 8 orders of magnitude more sensitive than to intervals of time, we will perceive the movement of the Ferrari car forward in the axis **x = 1.3471999 . 10^{26} m +110 m in 3.6 seconds** better than time shifts i.e. t_1 = **4.4937756 . 10^{17} sec. + Δt_1 = 3.6 sec**. ; (($\Delta t_2 = 0.01.10^{-6}$ sec. ; $t_3 = 0.01.10^{-6}$ sec.)), just as heat arises from the movement of individual molecules or life arises from interactions, non-living proteins. We could go on, but… won't you miss the bus? The concept of time is abstract and elusive, perhaps beyond human comprehension. ***Well, some understand little about time, some understand a lot, and there are those who know that "time is money"…and "only pyramids are eternal"…*** Fortunately, there is a vast world of things we understand about the universe that you can explore right now – thanks to our friends at Brilliant.org. Brilliant has thousands of hands-on lessons in science, math, technology and more. Their latest course, "Introduction to Probability," offers a practical guide to interpreting the world. You'll master the tools of chance, risk, and prediction while learning to model real-world situations and run simulations of everything from election results to the winner of the next World Cup. They even have

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(03)- lesson on "The Past and Future," where you'll explore how past outcomes may not reliably forecast future events in the ever-evolving tapestry of time. And since it's always a good time to learn we've created an entire series of lessons in collaboration with Brilliant to take your scientific knowledge to the next level. These lessons let you further explore the topics in our most popular videos, from rabies and mammalian metabolism to climate science and supernovae. Think of each one as an interactive, one-on-one version of a kurzgesagt video. To get hands-on with kurzgesagt lessons and explore everything Brilliant has to offer, you can start your free, 30-day trial by signing up at Brilliant.org/nutshell. And for kurzgesagt viewers: the first 200 people to use our link get 20% off an annual membership once their trial ends. Our shop has grown so much over the years, thanks to all of you! Now it's time to move our precious products to a bigger warehouse! But should our tiny birbs really have to carry all those boxes? No! Help us out and grab a box in our biggest sale ever! But first, we'll give you a little tour: Here you can see how our posters are actually created. And this is how our enamel pins are made. But watch out – there are some pretty creepy and dangerous things in here as well! And this is where the deals are crafted. They will only be available for a short time and
12:13
as long as supplies last, so head over to the shop now. The birds really appreciate your help!

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(03)– lesson "Past and Future" where you will explore how past results may not reliably predict future events in the ever-evolving tapestry of time. And because it's always a good time to learn, we've teamed up with Brilliant to create a whole series of lessons that will take your science knowledge to the next level. These lessons will allow you to further explore who is applying? Who goes there anymore? And you already understand 3+3D space-time (?) that the width of the three-entrance block of flats is x = 1.3471999 . 10^{26} m + ***9m*** ; the length of the block of flats is y = 1.3471999. 10^{26} m + ***40 m*** ; and the height of the block of flats is z = 1.3471999. 10^{26} m +***21m*** and that the increments are zero Δx = 0m ; Δy = 0m ; Δz =

0m ; and that the age of the block of flats is $\mathbf{t_1 = 4.4937756 \cdot 10^{17}\ sec. + \Delta t_1}$; $\mathbf{t_2 = 4.4937756 \cdot 10^{17}\ sec. + \Delta t_2}$; $\mathbf{t_3 = 4.4937756 \cdot 10^{17}\ sec. + \Delta t_3\ sec.}$* … while in the direction of the Ferrari, i.e. the “twin dilation” twin rocket) is $\Delta\tau_1 > \Delta\tau_2 = \Delta\tau_3$ topics in our most popular videos, from rabies and mammalian metabolism after climatology and supernovae. ||Imagine|| each of them as an interactive, individual version of the kurzgesagt video. To get hands-on experience with kurzgesagt lessons and explore everything Brilliant has to offer, you can start a free 30-day trial by registering at Brilliant.org/nutshell. And for kurzgesagt viewers: the first 200 people who use our link will get a 20% discount on the annual membership after the trial period. Our store has grown a lot over the years, thanks to you all! Now is the time to move our precious products to a bigger warehouse! But should our little birds really carry all those boxes? No! Help us out and grab a box in our biggest sale ever! But first, we'll give you a little tour: Here you can see how our posters are actually created. And this is how our enamel pins are created. But beware – there are some pretty scary and dangerous things here too! And this is where offers are made. They will only be available for a short time and

12:13 until stocks last, so hurry to the store now. The birds really appreciate your help!

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JN, 20.04.2024

Poznámky pro vložení do textu:

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