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Nobody Knows What TIME Really Is. But it might be this...

Nikdo neví, co je doopravdy ČAS. Ale může to být tohle...

Arvin Ash

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[Here is my comment in red nipples.](#)

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(01)- This video is sponsored by Wondrium. Stay tuned to the end for a special offer for Arvin Ash viewers. Time is as sure a thing in our lives, and in the universe as you can get. There is no escaping it. We have come to accept with no other choice, that time will flow forward, one moment at a time. It can never go backwards, we can never revisit our past. But why is it this way? If you go down to the subatomic level, into the realm of quantum mechanics, time does not appear to have such an uncompromising direction of flow. The equations of quantum mechanics are generally time symmetric. They don't seem to have a flow preference. You might say they are time agnostic. And even at the macroscopic level, if you watch a film of a bouncing ball, and then you play the film backward, it will not be so easy to tell the difference. This process also appears to be symmetric in time. But, as we all know, this is not quite 100% correct, because at the macroscopic level, the ball will encounter friction and heat from the bouncing, and will be losing some energy with every bounce. So the ball will not return to quite the same spot as its starting point. The ball player will be making up for this by adding energy from his arms to the ball. Yet, In quantum mechanics, it's just as natural to go forward in time as going backwards. And if we look at a typical Feynman diagram, we can turn the diagram either way. They are symmetric with time. It doesn't matter! So, if the world is based on quantum mechanics, and quantum mechanics generally doesn't have a direction of time, why is time then going forwards in our macro world? Where does this transition from time symmetry at the quantum level, to time asymmetry at the macro level occur? It begs the question, what is time anyway? How did it begin, and will it always go forward? That's coming up right now... The nature of time is one of the quintessential mysteries of the universe. To understand its irreversibility, we have to look for other irreversible processes in nature to see if there is any correlation. One such irreversible process is in thermodynamics. We are particularly interested in the second law of thermodynamics which concerns the direction natural processes. It establishes the concept of entropy as being restricted to either staying the same or always increasing.

What is Entropy? In very simplistic terms, it is a measure of disorder. Thus, the higher the entropy of a system, the higher the disorder. And the second law of thermodynamics tells us that for every process that occurs in the universe, the universe will be either more disordered, or at least as disordered as it was before. There is no process that will result in the universe being more orderly overall. Now, as I said the idea of disorder is a simple way to understand it, but a more rigorous definition of entropy has to do with information. In more precise

terms, entropy is related to the amount of information necessary to describe a system. Let's say we are looking at a neatly cleaned room. This requires relatively little information to describe, We have a chair here, a lamp there, a curtain behind the chair, etc. But now, if it's a messy room, then it will take more information to describe it. Like a green shirt draped in a complicated way over the arm, blue shirt resting over the arm of the chair and green shirt, etc. This disorder requires more information to describe. In the same way, a highly ordered system, let's say like the two different gases represented by the two colors, separated on sides of a chamber, requires much less information to describe than the same number of particles randomly mixed together in a larger volume. Entropy increases as the system become more disordered because it takes more information to describe. Thus, information is directly tied to entropy. And if entropy of the universe is always increasing, it means that the information necessary to describe the universe must also be increasing. And this may give us a kind of clue as to why time is going forwards. How you may ask? Imagine again that we have two gases on the two sides of a chamber. Now we open the middle of the chamber to allow the gases to mix. They'll mix together to make a kind of purple gas.

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(01)- This video is sponsored by Wondrium. Stay tuned until the end for a special **Arvin Ashe Audience Offer**. Time is as certain a thing in our lives and in the universe as you can get. There is no escaping it. With no other option, we accepted that time would move forward, one moment at a time. It can never go back, we can never go back to our past. **But why is that? HDV says why !!** If you go down to the subatomic level, **into the realm of quantum mechanics, time doesn't seem to have such an uncompromising direction of flow.** The equations of quantum mechanics **are generally time symmetric**. They don't seem to prefer flow. You could say they are agnostic of time. And even on a macroscopic level, if you watch a movie of a bouncing ball and then play the movie backwards, it won't be that easy to tell the difference. **I understand, yes...in microscales the chaotic flow of time is like Brownian motion and dtto also motion "along dimensions of length", that's why it's a "foam of dimensions" 3+3 D in the eyes of a "distant" observer-** In macroscale, space-time is already much expanded into "parabolic curvature", (but also other curvatures, which when "added up" are the parabola. (such as sections with a cone,..., there are infinitely many elliptical sections, there are also infinitely many hyperbolic sections, and if they are added together, it is only one parabola) (like...all right triangles are isosceles, there are infinitely many of them only one triangle is isosceles...it's like saying "all physical" states in the universe are inequalities, billions of states are inequalities, but only "one state - a state mathematical" rare state is the equation... yes..., in the microscales of the Planck scale there is a chaotic flow of time (there is a chaotic "running arrow of time") like Brownian motion and dtto also motion "along longitudinal dimensions". Therefore, it is a "foam of dimensions" 3 + 3 D in the eyes of a "distant" observer. On a macro scale, spacetime is already much expanded into a "parabolic curvature" (there are many other curvatures that when they "add up" are that parabola.) (Like conic sections. If all right triangles are unequal, there are infinitely many, only one triangle is unequal, that's like saying "all physical" states in the universe are inequalities, billions of states are inequalities, but only "One state", the reciprocal state, is an equation. This process also appears to be symmetric in time. **Yes, the 3+3D chaotic foam is symmetric in time, even in the unwrapping and unwrapping of the length dimension.** But as we all know, it's not quite 100% correct, because on a macroscopic level, the ball will encounter friction and heat when bouncing, and it loses some energy with each bounce. **Friction, energy, etc. do not play the essential role in this, but the "warping" of dimensions...** So the ball will not return **in the macro world, on a macro scale** to exactly the same place as its starting point. The ball player compensates by adding energy from his arms to the ball. Yet in quantum mechanics it is just

as natural to go forward in time as it is to go backward. O.K. And if we look at a typical Feynman diagram, we can flip the diagram either way. O.K. They are time symmetric. It does not matter! So if the world is based on quantum mechanics, and quantum mechanics generally has no direction of time, why does time in our macro world go forward? !! Because of what I keep saying: the universe expands from a state of spatio-temporal foam (which is also symmetrical for the flow of time) is linear to a state of macroscopic space-time that is no longer slightly curved, in which slightly more curved states "float" → fields, and even more crooked states are matter...they are conglomerates of "packed packages" of dimensions into formations not foam but packages born in that foam and they will be/are elementary particles of matter. Where does this transition from time symmetry at the quantum level to time asymmetry at macro level? That is exactly the right question: how does the **linear** "foam" of dimensions change to a **nonlinear** "gravitationally curved" global space-time in which galaxies and even gases and other states of matter produced as "compacted" macroforms also float from dimensions 3+3D No. *Unfortunately, I'm not a good mathematician and I can't describe it mathematically...and no one has helped me in 20 years of pleading on the Internet.* The question arises, what is time? The artifact "Time" (which presents itself in three dimensions) is the same as the artifact "Duration", which also presents itself in three dimensions and is called space.

(*) How did it start and will it always continue? This is coming right now... **The nature of time is one of the major mysteries of the universe.** To understand its irreversibility, we need to look for other irreversible processes in nature to see if there is any correlation. One such irreversible process is in thermodynamics. We are particularly interested in the second law of thermodynamics, which refers to the direction of natural processes. In macroscales, 3+3D expands, not collapses..., expands means that the flow of time "runs" here in one direction...we-objects "run" along the time dimension and cut out intervals on it, and that is the flow of time. If we-macroobjects wanted to cut the "back-to-back" intervals, it would be an imperceptibly small interval, i.e. in the order of 10^8 shorter interval, because we-humans are in the position of the universe that is 8 orders of magnitude less sensitive...it can be realized from the magnitude of the speed of light $c = 10^8/10^0 \rightarrow$ this is the human asymmetry of ""sensitivity"" to the length interval and the time interval. We humans travel through space in length intervals and also cut on these three unfolding global dimensions forward - backward, up - down, left - back right, but the sensitivity is 8 orders of magnitude different than that of time !!!!!!!!! !! ; with time we also "run intervals" forward and thermodynamically backwards, but we have never measured those intervals, they are 8 orders of magnitude smaller "backwards", incomparable to those "forwards" in the direction of the aging arrow = unwrapping of global space-time. Introduces the concept of **entropy** as a constraint to either stay the same or keep increasing. OK but it can also shrink: the processes of compounding material structures. In the genesis of the structure of matter from the Bang, a sequence of increasingly complex and complex structures is realized from atoms, through molecules and through compounds to macromolecules to DNA - this is the process "against" entropy... What is Entropy? Very simply put, it's a measure of clutter. DNA is a measure of order, counterentropy. So the higher the entropy of the system, the higher the disorder. And the second law of thermodynamics tells us that >**with each** ??? process that occurs in the universe, the universe will either become more disordered, or at least as disordered as it was before. Then there must be another third non-thermodynamic law that produces quarks and leptons first after the bang and then more and more complex matter up to organic matter and DNA There is no **process< that would lead to the universe it will be more organized overall.** Mistake !!! None ??? process ??? Mistake! On Earth, we see around us >almost all processes< that lead to the order of matter and not only that matter!!!! Only world war 3 will lead to the destruction of not only organic matter. As I said, the idea of disorder is a simple way to

understand it, but a more precise definition of entropy has to do with information. More precisely, entropy is related to the amount of **information necessary to describe the system**. **How much information does/did Bill Gates' first internet network have and how much does today's system that starts to think on its own - cybernetics? !!** Let's say we are looking at a neatly tidy room. It requires relatively little information to describe. We have a chair here, a lamp there, a curtain behind the chair, etc. But now, if it's a dirty room, more information will be needed to describe it. Like a green shirt draped elaborately over an arm, a blue shirt draped over the arm of a chair, and a green shirt, etc. This **>disorder requires more information to describe**. **Disturbances are evolutionary, see Darwin, disturbances also lead to new laws of interaction ... and disturbances mean that NOWHERE in the Universe is there a physical balance of states, i.e. a mathematical equation, the law of alternating symmetries with asymmetries**. Similarly, a highly ordered system, say like two different gases represented by two colors, separated on the sides of the chamber, requires much less information to describe than the same number of particles randomly mixed together in a larger volume. Entropy increases as the system becomes more disordered because more information is required to describe it. Information is thus directly tied to entropy. And if the entropy of the universe is constantly increasing, it means that the information necessary to describe the universe must also be increasing. And that can give us **some clues as to why time moves forward**. **That's not enough, there are more clues. E.g. The universe not only expands, but also collapses, in locations of the global space-time (galaxy) and in the locations of the space-time of the microworld (boiling vacuum, virtual pairs, interaction of matter with matter and with fields... for example *higgs-boson, higgs field, interacts with immaterial particles , to "give" them mass .. ahem ?!*** Again imagine we have two gases on two sides of the chamber. Now let's open the center of the chamber to mix and form a kind of violet gas

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(02)- This process only goes one way, from an ordered state of two separate red and blue gases, to a disordered state of a purple gas – a mixture of both gases. The key point is that this process is not time symmetric. The process is only one-way. It evolves from one state to the other, and you cannot go back to the prior state. Does this remind you of the forward only progress of time – the fact that you can never go backwards in time? Now, it's important to point out that it is not impossible for the mixture of gases to go back to the prior ordered state. But the problem is that there are so many possible places for the particles to be in the box, that the probability for all the red gas particles to be in one part of the box, and all the blue gas particles to be in the other part of the box is effectively zero. It is a statistical impossibility. It's not as if the reverse process doesn't exist; it's just suppressed. It doesn't happen. So now the question is does increasing entropy cause the forward flow of time? Time and entropy seem to be related. But how do we know one is the cause of the other? Couldn't it be equally possible that time is the cause of the one way direction of entropy, instead of the other way around. Entropy says that you can scramble an egg, but you can't unscramble it. The disordered state of the egg cannot go back to its original ordered state. Sure, this makes sense. But if you could reverse time, that is, if you saw a video of a scrambled egg backward, you would see it going back to its original ordered state. So what causes what? Does entropy cause time? Or does time cause entropy? If increasing entropy was directly responsible for the forward flow of time, it would be logical to presume that decreasing entropy would cause the backward flow of time. There are pockets of decreasing entropy everywhere. For example, the inside of your refrigerator decreases entropy by removing heat, that is, cooling the inside. But time does not run backwards inside your refrigerator. It still runs forward. If you don't believe me, place a watch inside and see what happens. Note that the second law is not violated here because the overall entropy still increases when

you consider the whole system of the refrigerator and the room that it's in. Your refrigerator doesn't work unless it's plugged in. It uses energy to run a compressor that provides the cooling. This creates more heat outside the refrigerator than the heat removed from inside. To understand the link to time, I think we need to get a better understanding of what time is. The problem is that we don't really know what it is, except that it happens to exist, and processes appear to evolve from the past to the future. What's the definition of time? The best answer in physics is that time is the process that brings the unknown future into a recorded past via the present. If you think about it, this requires an increase in information because every second, every moment that goes by is recorded as a definite past which are events that have definitely happened. This was not knowledge until it happened. When it happened, it became new information and thus added to the total information in the universe. More information is more entropy. And this could be related to the flow of time, according to some theories. Physicist, Lee Smolin suggests in a 2021 paper, that what distinguishes the past from the present is a kind of knowledge that is gained once indeterminate quantum events consisting of only probabilities in the present, become a classical definite past. According to Smolin, the past is completely classical. They are no longer probabilities. They are definite. They have already happened. They cannot unhappen. However, the future is quantum. It consists of probabilities. It is still unfolding. So what seems to separate the past from the present is whether it is knowable or not: whether it has become actual knowledge, something for which we can say, "yes, it was like this". So according to the paper, the change from a quantum indefinite present to a classical definite past is what defines the arrow of time. This points always in the forward direction as the quantum present constantly churns out a classical past. The future is also quantum according to Smolin. It consists of only possibilities. So we are living constantly in the very moment where probabilities become actualized, and reality becomes imprinted in the past as actual knowledge. Although Smolin does not talk specifically about information in his paper, if one interprets actualized knowledge as a kind of information being added to the universe, then perhaps, this is the link that connects entropy to time.

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(02)- This process only goes in one direction, from the ordered state of the two separate red and blue gases to the disordered state of the violet gas – a mixture of the two gases. The key point is that this process is not time-symmetric. The process is one-way only. It evolves from one state to another and you cannot go back to the previous state. Does it remind you of time only moving forward - the fact that you can never go back in time? Now, it is important to emphasize that it is not impossible for the gas mixture to return to its previously ordered state. But the problem is that there are so many possible places the particles can be in the box that the probability of all the red gas particles being in one part of the box and all the blue gas particles being in the other part of the box is effectively zero. It's a statistical impossibility. It is not that the reverse process does not exist; it's just suppressed. It will not happen. **So now the question is, does increasing entropy cause time to flow forward?** Time and entropy seem to be related. **Caution : perceive, realize that *"TIME"* is quantity-artifact-phenomenon http://www.hypothesis-of-universe.com/docs/c/c_384.jpg and "time" as the "flow-flow" of time is a completely different concept...it is the "cutting of intervals on the time dimension".** But how do we know that one is the cause of the other? (**) Couldn't it be equally possible that time is the cause of entropy going one way instead of the other way around. **"time" with a small n is the cause of both: both entropy and the composition of matter, both must be seen separately.** Entropy says that you can mix and slice, but you cannot decipher it. The disordered state of the egg cannot return to its original ordered state. Sure, this makes sense. But if you could turn back time, that means if you watched a scrambled egg video backwards,

you'd see it return to its original ordered state. **So what causes what?** Does entropy cause time? No, **a) the flow-flow of time is something else than b) "time-physical quantity = artifact – phenomenon of Existence.** Entropy is another view and folding is the opposite view. Let's assign entropy to the arrow of flow-flow of time "to the right" and compounding to the arrow of flow-flow of time "to the left" and... and not only that compounding is a process of "mixing arrows to the right and to the left". Or time causes entropy? If increasing entropy were directly responsible for the forward flow of time, it would be logical to assume that decreasing entropy would cause time to flow backwards. **OK but in a ratio of $10^8/10^0$.** For a photon flying in both expanding space and expanding time, the ratio of "expanding" intervals is **$c = 1/1$.** But in our position as Earth in the Universe, it is **$c = 10^8 / 10^0$.** Our position in space-time is "somewhat off-axis" expanding a little to one side. There are pockets of decreasing entropy everywhere. For example, the inside of your refrigerator reduces entropy by removing heat, that is, by cooling the inside. But time inside your fridge doesn't run backwards. He keeps running forward. If you don't believe me, put your watch inside and see what happens. Note that the second law is not violated here because the total entropy keeps increasing when you consider the entire refrigerator system and the room it is in. Your refrigerator won't work if it's not plugged in. It consumes energy to run the compressor that provides the cooling. This creates more heat outside the refrigerator than heat is removed from the inside. In order to understand the connection with time, I think we **need to better understand what time is.** O.K. The problem is that we don't really know what it is, **except that it happens to exist** foul ;...only we know little, almost nothing, about time. "Time" is a universe-making instance=artifact of the same stamp as "Duration" is universe-making. http://www.hypothesis-of-universe.com/docs/eng/eng_024.pdf In an abstract sense, one could say that "time" is anti-length and length is anti-time...that they are two sides of the same coin. **So protest : time is not something that exists by chance, on the contrary : and processes seem to evolve from the past to the future.** **What is the definition of time?** The best answer in physics is, **that time is a process,** no...no, ; Processes are changes that happen "in time" = during the passage of time and not only in it. Time is not a process, Time is a quantity and time-dimensions are the "substrate-net-yarn-grid-stage-" on which the "processes" take place, time itself is not a process. If "time were a process," then the statement "space is procers" would have to have the same value as saying that space is a process that brings the unknown future into the recorded past through the present. When you think about it, it requires an increase in information, sure ; the increase of information "about changes" of all, that is, changes not only in time, but also in matter and space and changes, even changes in laws..., i.e. **new laws are born,** because every second, every moment that passes is recorded as definitive past which are events which certainly happened. **Even every form of curvature of spacetime that "was" is gone, different from the new state of "presence" (the state of matter and their configurations) and than the new state in the future.** This was not knowledge until it happened. When that happened, it became new information and thus added to the total information in the universe. More information means more entropy. And that, according to some theories, could be related to the passage of time. Physicist **Lee Smolin** suggests in his 2021 paper that what distinguishes the past from the present is the kind of knowledge that is gained once the indeterminate quantum events consisting only of probabilities in the present become the classical definite past. **According to Smolin, the past is completely classical.** Try to think like this: Before the big quake, the universe was just a smooth infinite space-time without matter, without the flow of time and without expansion (because it was infinite in 3+3 dimensions) Then there was the leap change from the "state of the previous" to the state of "next = our "warped universe" with matter and fields, and with unwrapping of time and unwrapping of lengths until...?? to what ? It is either that it expands "into Nothingness..., or "our warped space-time with matter" floats in the original flat Euclidean grid-net-yarn 3+3D...

and then the "present" gathers and expands into "the future, not "into Nothing", and the past is already a deterministic state, the future is unknown as "changes are reshaped by the curvature of dimensions". The past is "preserved" as the changes developed and happened, they are definitive, yes; the future is the changes that will happen... sure, but we've known that for 2000 years. This is not a new insight for understanding "time" at all, nor for understanding the opinion that: *"time does not flow to us, but we flow to it"*. Furthermore, talking about entropy or "becoming" (Heidegger) will not help us to know more "behavior" of time: whether it has the same rate of flow throughout the entire history of the history of the Universe, whether the rate of time flow does not change at different stages of history...whether the rate of time flow is the same "all over the universe" or is it different locally, in many spatio-temporal locations of the universe. It won't help us figure out "why" the pace of time is the way it is on Earth. It will not help us to further investigate why the pace of the passage of time on Earth is the fastest and everywhere else it is said to be slower and slower (see the claim of the Czech Prof. Kulhánek). It won't help us find out if time also has dimensions. It will not help us to further investigate "how time bends" and where and what follows from this. It will not help us to find out what behavior time has in the "anti-world", i.e. in the second quadrant of the Universe "behind the gate". Etc. They are no longer probabilities. They are definitive. They have already happened. They can't happen. The question of "what" can and cannot happen to the same person from the past. This is also not exhaustively said 100%. However, the future is quantum. ??? Although the Universe needs probabilities, even QM, to produce the future, this does not mean that it does not need, for example, gravity or elementary matter, which has been unchanged since the Big Bang, for future reality. (the electron is still the same for 13.8 billion years and will be like that in the future). So the future is not just quantum. **It consists of probabilities.** Not only that... It's still in development. So it seems that what separates the past from the present is whether it is knowable or not: whether it has become real knowledge, something about which we can say, "yes, it was like this." So according to the article, the change from a quantum indeterminate present to a classical determinate past is what defines the arrow of time. ? It always points forward, because the **quantum presence** constantly **spews out = repeats** the classical past. According to Smolin, the future is also quantum. ? **At the quantum level the future is quantum, at the global gravitational level the future is different.** It consists only of possibilities. So we live constantly in that moment when probabilities are updated and reality imprints itself on the past as real knowledge. Although Smolin does not specifically talk about information in his article, if updated knowledge is interpreted as a kind of information that is added to them. The universe, then perhaps, this is the connection that connects entropy with time.

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(03)- If Smolin is correct and the arrow of time is due to indeterminate quantum events becoming the classical past. And if this knowledge is leading to more information constantly being created, then entropy is also increasing. And since the classical definite past becomes known, and cannot go back to being unknown, time cannot be reversed, and entropy also cannot be decreased. They all go one way. Quantum becomes classical, Information increases, entropy increases, and time flows only forward. Note that although it is established that information is related to entropy, both Smolin's paper and my extrapolation of his paper to information are not established theories, but conjecture. So you should take this only as food for thought. We don't really know what time is, but we are quite sure that that entropy is increasing in the universe, and thus it's getting increasingly disordered. This means that entropy must have been much lower earlier in time, especially near the big bang. How did the universe get to this low entropy, super orderly state at the beginning? This is a mystery.

But it brings our discussion of time to the scale of the universe and cosmic time. Will time continue to flow forward forever? To understand this, let's consider that entropy is also more precisely the conversion of usable energy, to useless energy. Gasoline or Petrol has more useful energy than the byproducts of burning it, which is heat and the gases in the exhaust of your car. This type of process is happening everywhere. Your body is burning sugar and turning it into less useful heat energy, for example. The light bulb in your home is converting useful electricity to less useful light and heat. These processes are going one way. And this also leads to the concept of heat death of the universe. If the entropy only increases, one hypothesis is that one day the universe will be in a state with no free or useful energy. At this point the universe will be just full of radiation and heat that can't be used to do any work. If this is the case, then nothing can happen. No physical movement, no chemistry, not even thoughts in brains. So ironically the heat death of the universe is also called the big freeze. Nothing can move anymore. If nothing happens in the entire universe, and not even thoughts or consciousness can exist, does time still continue to move forward? I'm not so sure. What we really need is a new theory of time that can be tested and verified to be correct. My dream is that a someone watching this video right now, comes up with such a theory, and changes the world. If you want to explore the physics of time in detail, one of best courses I have come across is on Wondrium, today's sponsor, called "Mysteries of modern physics: Time" It's taught by one of my favorite science educators, award winning professor, Sean Carroll. His course takes you on a mind-bending journey to explain how something you take for granted every moment of your life connects you to the very first instant of time at the big bang, how the past, present and future could be equally real, and how you actually live 80 milliseconds in the past. You can not only enjoy these great lectures by professor Carroll, but also from some of the best educators in the world. You'll be hard pressed to find a better online learning service than Wondrium. I myself have been a member of for a long time. I can't recommend them enough. You'll even see my testimonial at the bottom of Wondrium's home page. It's really easy to sign up right now because they are offering a free trial, and you can cancel at anytime, so you have nothing to lose, but a lot to gain. If you want to support this channel, and greatly expand the depth of your knowledge, be sure to click the special link in the description. And if you have any questions or comments for me or other viewers, please leave them in the comment section below. I try to look at all of them. I'll see you in the next video my friend.

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(03)- If Smolin is right and the arrow of time is caused by indeterminate quantum events becoming the classical past...and if this knowledge leads to the constant creation of more information, then entropy also increases. http://www.hypothesis-of-universe.com/docs/h/h_030.pdf And since the classical definitive past becomes known and cannot return to the unknown, time cannot be reversed. **The flow of time in one direction cannot be reversed to the opposite arrow only on a macro scale. On a micro scale on the Planck scales of the "world of quantum mechanics", this can be done, e.g. by "packing 3+3D, which leads to the production of matter.** <http://www.hypothesis-of-universe.com/index.php?nav=e> and entropy cannot be reduced either. They all go in one direction. Quantum becomes classical, information increases, entropy increases, and time only flows forward. Note that although information is found to be related to entropy, both Smolin's paper and my extrapolation of his paper to information **are not established theories, but conjectures.** So you should only take it **as food for thought.** **O.K.** We don't really know what time is, **we know it is, we just don't know everything about it,** but we are quite sure that this entropy is increasing in the universe and therefore it is getting more and more **disordered** . **No, it is also **also ordered**** http://www.hypothesis-of-universe.com/docs/eng/eng_009.pdf ;

http://www.hypothesis-of-universe.com/docs/g/g_041.pdf ; http://www.hypothesis-of-universe.com/docs/aa/aa_078.pdf This means that entropy must have been much lower earlier, especially near the big bang. **Disorder and complexity of ordered states are two different ways of looking at it.** How did the universe get to this super-ordered, low-entropy state to begin with? http://www.hypothesis-of-universe.com/docs/aa/aa_078.pdf This is a mystery. **Not a mystery, the understanding is obvious here** http://www.hypothesis-of-universe.com/docs/eng/eng_009.pdf But it brings **our discussion** of time into the scale of the universe and cosmic time. **I wish my endless monologue (20 years) was also a discussion-dialogue.** Will time flow forward forever? To understand this, let's consider that entropy is also more precisely the conversion of usable energy into useless energy. Gasoline or gasoline has more useful energy than the byproducts of its combustion, which are heat and gases in your car's exhaust. This type of process happens everywhere. Your body burns sugar and converts it into less useful heat energy, for example. A light bulb in your home converts useful electricity into less useful light and heat. These processes go in one direction. And this also leads to the concept of the heat death of the universe. **If** entropy only increases, one hypothesis is that one day the universe will be in a state with no free or useful energy. The universe is expanding and collapsing "simultaneously", expanding globally and collapsing in mini-localities... http://www.hypothesis-of-universe.com/docs/aa/aa_116.pdf At this point the universe will be full of radiation and heat which cannot be used for any work. **If** this is the case, then nothing can happen. No physical movement, no chemistry, not even thoughts in brains. So, ironically, the heat death of the universe is also called the big freeze. Nothing can move anymore. **If** nothing happens in the entire universe and not even thoughts or consciousness can exist, does time keep moving forward? **No. In such a universe, in which nothing happens, there is not and cannot be matter, and such a state was before the Big Bang, it was an infinite "stationary flat 3+3D space-time without fields, without matter, without the passage of time, without expansion.** I am not so sure What we really need is a new theory of time, **Yes, I've been talking about it over and over for years...but no one reads it, or even "gets it"????** that can be tested and verified as correct . **My dream* is that someone watching this video right now comes up with a theory like this and changes the world.** **So: go read it, I'm sorry. It's HDV.** If you want to explore the physics of time in detail, one of the best courses I've come across is on **Wondrium**, (**HDV is also on the site**) today's sponsor, called **"Mysteries of Modern Physics : Time"**. It is taught by one of my favorite science educators, award-winning professor, **Sean Carroll.** **I've been sending him a letter for 20 years now and then (approx. 5 letters in total)...and he probably never opened it, or the letter didn't go to him, he didn't read it, otherwise he would have already - even out of decency - called.** His course takes you on a mind-bending journey to explain how something you take for granted every moment of your life connects you to the very first moment of the big bang, how the past, present and future could be equally real, and how you actually live 80 milliseconds in the past. You can look forward not only to these great lectures from Professor Carroll, but also from some of the best educators in the world. **You'll be hard-pressed to find a better online education service than Wondrium.** **I never read about it, today I see-hear about it for the first time. And I'll look into it. It will probably be unattainable for me because I don't know English. (and I don't want to learn English there).**

I myself have been a member for a long time. I cannot recommend them enough. You'll even see my testimonial at the bottom of the Wondrium home page. It's really easy to sign up now **??** because they offer a free trial and you can cancel anytime, so you have nothing to lose but a lot to gain. If you want to support this channel and greatly expand the depth of your knowledge, be sure to click on the special link in the description. And if you have any questions or comments for me or other viewers, please leave them in the comments section below. I try to look at everyone. See you in the next video my friend.

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JN, kom 08.11.2021