https://www.youtube.com/watch?v=K8gV05nS7mc

Did Time Start at the Big Bang?

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18. 7. 2019
My opinions are in the text in red font

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(01)- Thank you to LastPass for sponsoring PBS Digital Studios Our universe started with the Big Bang. But only for the right definition of our universe and "started" for that matter. In fact, the Big Bang is probably nothing like what you were taught. A hundred years ago, we discovered the beginning of the Universe. Observations of the retreating galaxies by Edwin Hubble and Vesto Slipher, combined with Einstein's - then - brand-new general theory of relativity, revealed that our universe is expanding and if we reverse that expansion far enough - mathematically - purely according to Einstein's equations, it seems inevitable that all space and mass and energy should once have been compacted into an infinitesimally small point - a singularity. It's often said that the universe started with this singularity and the Big Bang is thought of as the explosive expansion that followed. And before the Big Bang singularity, well, they say that there was no 'before' because time and space simply didn't exist. Now, if you think you've managed to get your head around this bizarre notion, then I have some bad news: that picture is wrong.And at least according to pretty much every serious physicist who studies the subject. The good news is that the truth is way cooler, at least as far as we understand it Now, before a certain crowd starts with "all the scientists keep changing their minds - they don't know anything", or "the Big Bang Theory is just a theory" Let me be very clear, the evidence for a hot dense early universe is practically incontrovertible.The Cosmic Microwave Background is a direct line of sight to the universe as it was Only a few hundred thousand years after the hypothetical beginning of time. We can see pretty much directly that all space and matter in the universe was once crunched at least a thousand times closer together There's also the relative abundance of simple elements hydrogen and helium in particular Whose ratio is exactly what we expect if the entire universe was a dense billions of degrees nuclear furnace for the first several minutes of its existence In fact, There's powerful evidence that we should not rewind Einstein's equations that far, at least without introducing some very new physics For one thing there's also convincing observational evidence that the time before around 10 to the power of negative 32 seconds Included a period of extremely rapid expansion called cosmic inflation We've talked about the reasons we need inflation in previous episodes and I'll come back to it in a bit adding that initial growth spurt solves a couple of the big problems with the Big Bang Theory, but it doesn't change the fact that Rewinding the expansion of the universe even at different speeds still leads us towards the T equals zero singularity. I'm going to come back to why we need to forget the idea of this singularity Doing so will change the way we think about cosmic inflation and about the beginning of the universe But before we kill the whole idea of the Big Bang singularity, we need to understand what we're killing What does it really mean for all of space to be compacted into a single point? This idea is especially weird if the universe is infinite Now the

universe may or may not be infinite but if we can understand this for the infinite case Then getting all of this for the finite case is baby stuff at least by comparison It's tricky to talk about the size of an infinite universe Instead of the overall volume or radius we talk about the size of an expanding infinite universe in terms of the scale factor That's the distance between any two points in space at some moment in time Relative to their distance at some other reference moments that reference moment is typically taken to be right now So the scale factor of the universe is currently one Several billion years ago, the scale factor was half, all points in the universe were half as far apart as they are today. So when I talk about rewinding the expansion, I mean running the clock backwards to track a shrinking scale factor. One way to do that is to keep halving the scale factor.Do that enough times and any two points, no matter how far apart they were, will end up as close together as you'd like. Do it enough times and the universe could end up as hot and dense as you like But it'll still be infinite, spatially, the scale factor is incredibly small But an incredibly small number times infinity is still infinity Rewinding the universe this way doesn't leave us with a singularity The singularity is when all points are not just next to each other but literally in the same spot at which point temperature and density are infinite.That last tiny step is a doozy The scale factor goes from incredibly small to zero. So the infinite universe becomes infinitesimal all points become the same point and three-dimensional space becomes zero dimensional That's the singularity We say that it didn't happen in any one place because a point

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(01)- Thanks to LastPass for sponsoring PBS Digital Studios. Our universe began with the Big Bang. (("Our" Universe, the one after the Big Bang, began in the sense of the beginning of the passage of time and the beginning of the unfolding of space-time and the beginning of the genesis of the construction of matter from the simplest form to the most complex)). But only for the correct definition of our universe and the "beginning" of it. *In reality* the big bang is probably nothing like what you've been taught. One hundred years ago we discovered the *beginning of the universe*. ((They discovered the beginning of "our" Universe in the sense of the beginning of the passage of time and the beginning of the unfolding of space-time, in which "our Universe" began the genesis of the "transformation of everything")) Observations of receding galaxies by Edwin Hubble and Vesta Slipher combined with Einstein - then a completely new general theory of relativity, *revealed that our universe is expanding*, ((Hubble and Vesta estimated the expansion. I believe that after a more careful examination, it will be clarified that it should be an "unpacking" of the space-time dimensions http://www.hypothesis-of-universe.com/docs/c/c_071.jpg)) and if we sufficiently reverse this expansion - mathematically - purely according to Einstein's equations, it *seems* inevitable that all space, matter and energy *should have once been compressed into of an infinitesimally small point - singularity*. ((I would suggest the big-bang by an "inflationary jump" in the sense of an "instantaneous" change of state from the original flat Euclidean smooth 3+3D space-time before the Bang to an extremely curved 3+3D non-zero location - our future Universe after the Bang..., while the ""event "" changes of state are not related to time as such..., they occur "whenever", and the location of the new "curved dimensions" occurred "in the previous" infinite flat 3+3D, and the location is arbitrarily large, because in the infinite state of np, units cannot be determined. And it must be added right away that Time is just an artifact = a quantity "the name of a static state", where the flow of time occurs only when it begins to move "along time dimensions" = to move the observed object-subject. Time does not run for us, but we run "along " of time, along the time dimension, and as we cut off those time intervals, we perceive it as the passage of time. Before the Bang, "time did not run" because there was "nothing" to run along the time dimension. After the Bang, a "boiling vacuum" arose and objects from the dimensions were packed into it and those "started" along

the time dimension with pos ouvat..., etc. as HDV says. Since the Big Bang, there has been a **simultaneous A)** global unwrapping of plasma = "boiling" state of 3+3 dimensions and **B)** packing of 3+3 dimensions into more and more complex and complex systems, so that the more complex and even more complex ones are "born" less and less and less http://www.hypothesis-of-universe.com/docs/aa/aa_037.pdf ; http://www.hypothesis-of-universe.com/docs/g/g_041.pdf ,.. that is, there is the least amount of the most complex matter in the Universe (and that is precisely on Earth - see my the pyramid). What I mean to say is that *first* there must be a "production of those arrangements = higher complexity of the system" so that *then* the entropic phenomenon can occur, i.e. the thermodynamic arrow of "unpacking = disintegration" of the highly complex = ordered into curvature complexity into less complex -a more ordered state with a smaller set of curvatures, i.e. the state (most) ordered to less ordered systems. The transformation-transformation of the state of "most ordered" = Euclidean flat 3+3D spacetime to the state of extremely chaotic = curved disordered happens in the universe by a "jump". And then **slowly** it happens - that entropy takes place - the unfolding of dimensions, i.e. states with higher order change to less ordered ones, entropy grows. So in space: there is always a "jump" change from "smoothness" to "curvature" and then slowly (over time) the curvature changes to smaller and smaller curvatures. Why ? I don't know that yet. The first "jump" happened in Třesk...and others and others followed.))

((In the macro world, all three dimensions of time and length expand - you say the 3+1 universe expands, I say the 3+3 universe expands. But in the microworld of Planck intervals there is a "boiling foam" of dimensions which can be understood as a chaotic transformation of curvatures when "if you walk a dimension", you go "forward" for one moment and "backwards" for another moment along the same dimension dtto after each dimension of 3+3 D, therefore it is a foam where time does not go in one direction like in the macro world. And this foam is not still chaotic since the Bang ; in this foam it is born creating "geons" = packages of precise shapes using different amounts of dimensions, the packages then have conglomerating shapes. Each package = elementary particles of matter then have a different number of dimensions and with different curvatures of packing ... then the package is " clone" = a frozen entity to the "vibration of the foam". The bundles connect - connect into conglomerates = atoms, which then into molecules, compounds, chemistry, biology, etc. up to DNA. These "foamy" structures of dimensions then "float" in a less curved 3+3D space-time, are obvious only three to four (gravitational field, electromagnetic field, weak field, gluon field, Higgs field, etc.); in these fields those clusters-conglomerates of packed dimensions "float" and... and 4 fields then "float" in the basic Cartesian grid - a yarn - a grid of totally flat 3+3D. - - So physicists for now !!! they don't need more time dimensions in the macro world of fields, but when they search for the essence of matter they will need a more dimensional state of existence)) * time is only one dimension, time, and we can only go in one direction in time,* ((**no** !, in the macro world, time i.e. all three dimensions of time and length) unfolds in only one direction, but in the micro world the direction of the "flow" in that foam "pulsates" in chaotic directions. A new shift in thinking with HDV is that the 3+3D smooth-flat non-curved space-time in this universe is just...just a "substrate-substrate-raster" to realize the dynamics of transformations of matter and space-time to each other...that "curved states of 3+3D space-time "they float, they are nested" in that "grid, flat Euclidean space-time" ...; so TIME doesn't run for us, it's a dimension, but we-objects "made of wrapped dimensions" run along that time dimension, along that grid, and we cut out time intervals on the dimension, which we then perceive" as the flow of time. **Time does not run for us, but we run for it**, we run "for it". Physicists lack precisely this new insight-view to understand the multidimensionality of time, they lack to explore this HDV vision.

The early universe after the bang had to start its activity "soaking foam dimensions" which has since the very birth had topological defects. Topological inhomogeneity http://www.hypothesis-of-universe.com/docs/c/c_168.gif 3+3D "boiling vacuum" http://www.hypothesis-of-universe.com/docs/c/c_428.jpg was *transferred* even after "inflation" to cosmic dimensions http://www.hypothesis-of-universe.com/docs/c/c_222.jpg Why? i don't know But if that was the case, these defects are the motive for the dramatic genesis of other conditions. As I have already said elsewhere, the principle of alternating symmetries with asymmetries prevails here already "in the beginning" - topological defects are proof of this. Before the big bang, there were no topological defects, except perhaps for one, and that was the big bang. Why ? I don't know...but it's clear that the Bang was a jump-change of state according to the rule about alternating symmetries... I consider the force field to be a "space-time of a certain curvature of dimensions 3+3", in which a packed ball-wave-wave packet of packed dimensions "floats" = elementary particles. A simplified picture is here (I don't have another, more suitable one) http://www.hypothesis-of-universe.com/docs/c/c_426.jpg ; http://www.hypothesis-of-universe.com/docs/c/c_416.jpg in a power field that represents "basic grid 3+3D", grid with little curvature, **swims** and tremble elementary particles as **packages** made of dimensions, you have to put yourself in the imagination http://www.hypothesis-of-universe.com/docs/c/c_416.jpg

The quantum world rules on the scales of the microworld because this state is "crumpled-packed space-time itself, it is a "foam" of dimensions, an interaction of crooked states of dimensions. The quantum field is essentially a "picture - a projection" onto the plane of the observer, who sees "a kind of" disjointed state of "points and gaps"; "zero and one" ; "of nothing and of something"; "clusters and non-clusters". The quantum world from the microworld passes into the gravitational macroworld, so-and-so, that the curvatures of the spacetime are "unpacked" into precisely defined curves of "gravitational fields", i.e. a slightly curved dimension. It is therefore a "transition" from very crooked states of spacetime to less and less crooked states of cp..., the universe is expanding, its curvature is unfolding, which is supposed to disappear sometime in the "big-crunch". That is: Big-bang is such a "quick-jump transition" from the state of flat cp (before the big bang) to the opposite state = very curved = "foam spacetime" and..and then a smooth transition to the big-crash occurs, i.e. genesis now occurs changes-changes (alternating symmetries with asymmetries) of these curvatures in the direction "from the "foam of the Bang" to the flat empty vacuum in the big-crash". It is still interesting, however, that between these two end states of the dynamic Universe, i.e. "initial state = big-bang" and "end state = big-crunch", what is happening, according to the principle of alternating symmetries with asymmetries, not only the "unwrapping" of the "foam" dimensions " into the global-space-time (between galaxies), but in that "initial foam" there is also the packing of 3+3 dimensions np into those "packages-geons-balls" = elementary particles of matter, where in addition those elements are transformed pyramidally - conglomerationally they cluster into more complex structures, i.e. into atoms, molecules, compounds. At the same time, the pyramidal sequence of assembly also "runs" into a series - clusters of dust + stars + galaxies. And even in the middle of the genesis of the universe from the big-bang to the big-crash, the initial foam is not only "consumed" by the "unwrapping" of the curvature, but even another new "foam" is "born" in a vacuum, that is, on smaller and smaller time-space scales , the foam in this vacuum is even finer than the "initial post-Bang foam"...as if another new space-time was being born "from the depths of the Planckian vacuum".

Hořava lamented that although CERN produced the Higgs boson, nothing else, that he expected the discovery of some symmetries, supersymmetries, which would help explain why we live in such a slowly evolving universe. I will add: In HDV, for many years, I have had

suggestions for alternating symmetries with asymmetries, which leads to the genesis of transformations through collaborations with curvatures of dimensions **a)** packed into packages=material elements in the microcosm with **b)** those 3+3 unpacked into the macrocosm. Even today, in every place of the universe, the foam of boiling dimensions still "emerges" "from Nothingness", i.e., from the vacuum on the Planck scales, and then part of it "unwraps" part of it sinks = disappears in the curvature singularity http://www.hypothesis-of-universe.com/docs/c/c_241.jpg at every point of the Universe, the boiling vacuum expands like this (the foam is not in the picture).

Each cycle starts with a big bang, but does not end with a big crunch, says Penrose and calls these Eony cycles. ((Maybe yes, the universe ends with "melting", unpacking the curvature of space -time dimensions to the Euclidean surface space to make this 3+3D condition (without matter, without fields, without flow flow, without expansion) Burning dimensions to extremely wrapped-wrapped, into the extreme foam of dimensions, in the form of plasma, extreme screaming space-time, which is "projection" (eg to the plane of the raster), or "in cut" as "quantified"… zeros and number one "," points and gaps "," nothing "and" something ", the extreme grain, because the projection of packed-backed dimensions is a view of some quantum.)) But at the end of the EON, you change the scale and press it all to Hawking's radiation together . ((And it is not easier to interpret that: at the end of the EON, which is to unpack all the shortening dimensions of space -time "outside" matter and "inside" of matter, that there will be totally Euclidean 3+3D space -time, which “”anytime and anywhere”” - bangem, I say in HDV there will be a change in the state of the pre -concrete to the stitches, ie flatness with a jump (phase?) turns into extreme curvature of all dimensions -boiling, messy, thick foam dimensions = plasma. And now the genesis in the foam: packing into frozen geon-balls = elementary particles and… and unpacking those dimensions to the global environment of a bunch of galaxies..)) Penrose - the second law of thermodynamics : Entropy increases . ((Entropy theory is a beautiful thing… but there is also "something" that is the opposite of entropy! And this is the "production of matter - elements and matter" more complicated and complex entities until we end up in protein biology in DNA)) We see that it is increasing. But the fact that entropy is increasing means that it had to be smaller in the past. ((and the smallest entropy had to be in the "chaotic foam of dimensions", after a bang in which genesis began to organize increasingly complex and complex matter, .. and genes of physical fields, .. and genesis by interaction in the micro -world,… and parallel genes of laws and rules and principles…)). The universe really had to start with very little entropy, otherwise we just can't explain what we see. ((O.K. "foam = plasma" = crumpled space-time and it starts to **unpack** into the network-to a web in macro-mock http://www.hypothesis-of-univeSe.com/docs/c/c_362.jpg = http://www.hypothesis-of-univeSe.com/docs/c/c_241.jpg ; http://www.hypothesis-of-univeSe.com/docs/c/c_344.jpg (13.8 billion years after Bang) and in parallel with it **pack** into those geons = elementary particles, http://www.hypothesis-of-univeSe.com/docs/c/c_283.jpg ; http://www.hypothesis-of-univeSe.com/docs/c/c_266.jpg , then to atoms, molecules, compounds → all this is organized for spacetime. . http://www.hypothesis-of-universe.com/docs/eb/eb_002.pdf

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Note:
However, the weights of elementary particles come from the Higgs field, says Penrose (*) I have a different interpretation. http://www.hypothesis-of-universe.com/docs/aa/aa_188.pdf ; http://www.hypothesis-of-universe.com/docs/aa/aa_176.pdf ; http://www.hypothesis-of-universe.com/docs/aa/aa_175.pdf ;

((Just the sentence to this: The weight is the property of the mass, so after the package is wrapped using several selected dimensions and this package is "connected" to another wavelet and then further interconnection and more… Each configuration of used and packaged dimensions then indicates the weight packed dimensions (atoms, molecules, compounds) ..)) I describe the creation of a big-bang here

http://www.hypothesis-of-universe.com/docs/aa/aa_178.pdf zde str. 4
http://www.hypothesis-of-universe.com/docs/aa/aa_174.pdf
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I describe the creation of a big-bang here And then there are more and more considerations on Big-Bang on other websites. What is before the big-bang

http://www.hypothesis-of-universe.com/docs/aa/aa_046.pdf ;
http://www.hypothesis-of-universe.com/docs/aa/aa_054.pdf ;
http://www.hypothesis-of-universe.com/docs/aa/aa_065.pdf ;
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← End of note

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and continued Did Time Start at the Big Bang? Matt O'Dowd →

The universe is often said to have begun with this singularity, and the Big Bang is thought to be the explosive expansion that followed. And before the Big Bang singularity, well, they say there was no "before" because time and space just didn't exist. ((Quite the opposite. Before the big bang, there was only a two-dimensional state of spacetime. I proposed an "inflationary jump" for the big-bang in the sense of an "instant" change of state from the original flat Euclidean smooth 3+3D spacetime before the Big Bang to an extremely curved 3+3D non-zero location - our future Universe after the Big Bang.)) Now, if you think you have managed to navigate this bizarre idea, then I have bad news: the picture, the vision is wrong. At least according to almost every serious physicist who studies this topic. The good news is that the truth is much colder, at least as far as we understand it. Now, before a certain crowd starts saying "all scientists keep changing their minds - they don't know anything" or "the big bang theory" is just a theory", let me be very clear. The evidence for a hot and dense early universe is virtually irrefutable. ((After the Big Bang, a "boiling vacuum" = plasma occurred and objects from dimensions were packaged in it. Since the Big Bang, the following has been going on simultaneously: **A)** global unwrapping of plasma = "boiling" state of 3+3 dimensions and **B)** packing of 3+3 dimensions into increasingly complex and more complex

systems, then the more complex and even more complex ones are "born" less and less http://www.hypothesis-of-universe.com/docs/aa/aa_037.pdf ; http://www.hypothesis-of-universe.com/docs/g/g_041.pdf ,.. In the macro world, all three dimensions of time and length expand - you say the 3+1 universe expands, I say the 3+3 universe expands. But in the microworld of Planck intervals there is a "boiling foam" of dimensions which can be understood as a chaotic transformation of curvatures when "walking along the dimension" you go "forward" for a moment and the second moment after the same dimension "backward" dtto after each dimension from 3+3 D, that's why it's a foam where time doesn't go in one direction like in the macro world. And this foam is not still chaotic since the Bang; in this foam it is born creating "geons" = packages of precise shapes using different amounts of dimensions, the packages then have conglomerating shapes. Each package = elementary particles of matter then has a different number of dimensions and with different packing curvatures...then the package is a "clone" = a frozen entity to the "foam shake". The packages connect - connect into conglomerates = atoms, which then into molecules, compounds, chemistry, biology, etc. up to DNA. These "foamy" structures of dimensions then "float" in a less curved 3+3D space-time, there are apparently only three to four (gravitational field, electromagnetic field, weak field, gluon field, higgs field, etc.); in these fields those clusters-conglomerates of packed dimensions "float" and... and 4 fields then "float" in the basic Cartesian grid - a yarn - a grid of totally flat 3+3D. - - So physicists for now !!! they don't need more time dimensions in the macro world of fields, but when they search for the essence of matter they will need more dimensional state of Being))

The Cosmic Microwave Background is a direct line of sight into space as it was only a few hundred thousand years after the hypothetical beginning of the *flow* of time.We see quite directly that all the space and matter in the universe was once compressed at least a thousand times closer together. Plasma is an extremely curved state of space-time dimensions. There are also relative abundances of simple elements, notably hydrogen and helium, the ratio of which is exactly what we would expect if the entire universe were a dense nuclear furnace at a temperature of a billion degrees during the first few minutes of its existence. In fact, there is strong evidence that we would not have Einstein's the equation so far, at least without introducing some completely new physics. HDV. On the one hand, there is also convincing observational evidence that the time before around 10^{-32} sec. includes a period of extremely rapid expansion called cosmic inflation This inflation is not proven but assumed. We talked about the reasons why we need inflation in previous parts, it is necessary to examine my proposal : http://www.hypothesis-of-universe.com/docs/c/c_239.jpg and I will go back a little and add that the initial growth spurt solves a couple of big problems with the Big Bang Theory, but that doesn't change the fact that rewinding the expansion of the universe at different rates still leads us to a T-time equals zero singularity. I also don't think that "our" post-Cod universe originates in a zero singularity. The initial state of the post-Big Bang universe is a location with an extreme "density of crooked dimensions" and this location both : **a)** expands and **b)** collapses... and this explains the size of the location = "singularity", it is arbitrarily large, the space-time here is "foam-swelling" ” and thus also changes the “density” of the curvature of the dimensions...which simultaneously expand and collapse; I'm not a mathematician so I can't put it better.

I will return to why we must forget the idea of this singularity. If we do, it will change the way we think about cosmic inflation and the beginning of the universe. However, before we kill the whole big bang singularity idea, we need to understand what we are killing.What does it really mean that all of space is compressed into a single point? This idea is especially strange if the universe is infinite. ((If the line is infinitely long, (from minus infinity to plus

infinity), then ask yourself the question: how big is the almost infinite segment on this line? or how big is the almost zero segment on this line? → Almost-zero = almost-infinite. And it doesn't even matter the choice of unit size.)). Now the universe may or may not be infinite, ((However, the author Matt means "our post-Bang universe"…; the pre-Bang universe is infinite 3+3D space-time, in which the "almost-infinite = almost-singular" location "smashed" (exploded), in which the curvatures of the dimensions changed with a jump. Before the Bang, only non-curved dimensions, after the Bang, a locality "is born" (("almost -infinite = near-singular = near-zero")) with extremely crooked dimensions and ...and there will be further genesis of unfolding time and length dimensions into "global-universe and ...and packing dimensions into matter.)) but if we can understand it ((HDV)) for the infinite case, then getting all this for the finite case is child's work, at least in cf on her. It is difficult to talk about the size of the infinite universe. Instead of total volume or radius, we're talking about the size of the expanding infinite universe in terms of scale. ((O.K. + the packing of dimensions into geons=balls, which are mass elementary particles that then conglomerate together **a)** into chemical, biological structures...**b)** into stars and galaxies and dust-gas formations.))
This is the distance between any two points in space at a certain moment in time relative to their distance at some other reference moment, the reference moment is usually considered to be right now. So the scale factor of the universe is currently one. A few billion years ago the scale factor was halved, all points in space were half as far apart as they are today. ((??)) So when I talk about expansion rewind, I mean turning back the clock, ((today looking at the large scale of the universe we are in an "expanded" space-time (expanded dimensions of time, expanded space) in which " they float" packed packets of matter - elementary particles further connected by physical, chemical or biological reactions ...etc.)) so that it is possible to observe the shrinking factor. One way to do this is to keep halving the scale factor. Do this often enough and any two points, no matter how far apart they were, will end up so close together, ((or collapse today's space-time and you will gradually arrive (through the relic density of the world) into the dimensional foam, i.e. the starting plasma and the two points will also be closer and closer and closer…)) as you would like. Do this enough times and the universe can end up as hot and dense as you want, but it will still be infinite, spatially, the scale factor is incredibly small, but an incredibly small number of times infinity is still infinity. ((O.K. If you take a Euclidean flat 3+3 spacetime and "squeeze" any volume of 3+3D dimensions into it into extreme curvature, the outer spacetime will still be flat, infinite. The curved states of the sites will "float" in the infinite 3+3 spacetime as they float atoms. Molecules, compounds... and so the stars and galaxies float (the crooked dimension) in that unfolded space-time)). Rewinding the universe in this way does not leave us a singularity. A singularity is when all points are not just next to each other, but literally in the same place, in which the temperature and density are infinite. That last little step is insane The scale factor goes from incredibly small to zero. . So the infinite universe becomes infinitely small, all points become the same point, and three-dimensional space becomes zero dimension. That's the singularity. We say it didn't happen in any place because period.
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(02)- is zero dimensional there weren't spatial dimensions for it to happen in At the same time we say the Big Bang happened Everywhere at once because even the tiniest fraction of a second later The universe has infinite size and everywhere is expanding equally Even if the universe is not infinite then whatever space there is Comes into being at the same time from that singularity. But what happens to time at the Big Bang singularity? To get that you can't think about the universe as having one big clock that Rewinds and then winks out of existence of the Big Bang or into existence if you're going forward No, you have to think about time in

the way Einstein Intended there is no universal clock time is relative Clocks are attached to each observer each moving frame of reference to see what time does at the Big Bang We have to trace a path through space and time back to the singularity We trace a path called a geodesic which in general relativity is the shortest path between two space-time coordinates These are the grids we use to map space-time Remember that in our rewind all points in the universe get arbitrarily close together before merging at T equals zero Well, that's the same as saying that all geodesics in the universe converge at the Big Bang singularity In the same way all lines of longitude converge at the North Pole so each Geodesic tracks earlier and earlier times as it approaches the Big Bang infinite clocks rewinding toward zero and then they all converge and Then what? well, then nothing.All geodesics end at the Big Bang singularity and their timelines end with them Or they start depending on how you want to think about it The point is that in the pure Einsteinian picture There is no before the Big Bang because no time line in this universe can be traced there. This is called geodesic in completeness and it also happens at the singularity in the center of a black hole all timelines end this time in the forward direction The analogy with the North Pole is a good one and Einstein himself used it.Lines of longitude end at the North Pole and it's meaningless to ask what is north of the North Pole? from the pure Einsteinian point of view It's meaningless to ask what happened before the Big Bang or after reaching the black hole Center? Okay, so I'm taking my time to explain something I already told you is wrong But it's important because the extreme weirdness of the Big Bang singularity is part of what tells us. It's wrong Any time you encounter a singularity in the mathematics of a physical theory you have good reason for skepticism It's probably telling you that your physical theory is incomplete and that you push that theory too far That's what's happening here We used general relativity to rewind the universe, but we already know that despite its incredible successes GR Is an incomplete theory? At the crazy densities and temperatures of the Big Bang singularity, and just after, GR comes into terrible conflict with quantum mechanics We've talked about that conflict and its possible resolutions before But the upshot is that we just don't know how the universe behaves in those conditions But we do know that pure general relativity is not a good description and so he probably shouldn't believe its prediction that all space was compacted into a single point and that this is where Time started. Ok. So what are the alternatives? Can we really track Geodesics? and the timelines they embody through the Big Bang and out the other side If so, what do we find there? There are several possibilities and they deserve their own episodes and we'll actually get to those soon But to whet your appetite, first up, cosmic inflation can offer a temporary reprieve from the singularity. Eternal inflation suggests that our universe appeared as a regularly expanding bubble in an unimaginably larger continuously inflating space-time in that case before the Big Bang was a period of exponential expansion that could have lasted indefinitely We'll get to the nitty-gritty of that with its inflow tongs and bubble universes real soon There are also various cyclic universe options the first cyclic universe idea was the Big Bounce in which the Gravitational attraction of all matter in the universe was enough to cause it to re-collapse and then presumably bounce outwards again We now know that there isn't anywhere near enough matter to do that unless we bring in string theory the Steinhardt-Turok model suggests that our universe floats in a higher dimensional space living on geometric objects called brains collisions between those brains initiate cycles of expansion of contraction Then there's Roger Penrose Conformal cyclic cosmology it's even weirder

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(02)- is zero dimension, there were no spatial dimensions to make it happen. ((But your interpretation is a wrong view of "shrinking" of space intervals at time. A more elegant and only possible way is to curvage dimensions and packaging into "extreme foam"… which

immediately starts to unpack and pack in parallel into small geons = ball = elementary particles of matter.)) At the same time, we say that the Big Bang happened everywhere , ((O.K. became in the chamber space-time, not everywhere, but anywhere, in arbitrarily large locality (skoroneconecone = skoronul) where extremely wrapped up dimensions… etc.)), because even the smallest fraction of a second later the universe has an infinite size ((Reflection error: The universe before the bang is different than after the bang.)) and it expands the same everywhere. ((Not. Everywhere "selected" volume from space has different dimensions and always has a different status of matter. Http://www.hypothesis-of-univeSe.com/docs/c/c_240.jpg in each Any locality of the universe runs at a different pace (see OTR and according to str) and runs in each locality a different pace of expansion = unpack space.)). Although the universe is not infinite, any space that exists is at the same time from this singularity. ((No, it's not so.)). But what happens to time in the singularity of the Big Bang? ((**TIME** is a **quantity** that has a dimension, and only when "someone-some" shifts "after the dimension of time" does it cut on it intervals and then perceive them as a flow, passage of time, we objects run after the time dimension, After that 3+3D grid, so that the time dimension unpacks, changes its curvature)). To achieve this, you can't think about the universe as it has one big clock that turns and then blinks to stop existing after a big bang, or formed when you go forward. No, you have to think about the time Einstein intended: there is no universal hourly time, time is relative. ((This is an unfortunate word-renewal is an unfortunate name of changes in the flow of time. The pace of the passage of time varies when we observe it from the observer's system on other bodies in motion uniform (p) and accelerated (OTR). And the fact that the pace of the passage of time is changing cannot be called "relativity".Clock = mechanism for the production of accurate intervals, ticks the same everywhere, ie even on a rocket that flies **"v" → "c",** where we "think" that he dilated on the rocket that the commander - Paul ages slower than Peter on Earth… No, no, the clock atomic ticks the same everywhere, even on the rocket, only we get here on the ground from the rocket we get "rotated" information, rotated systems with dilated intervals on the time dimension. We perceive the commander of the rocket, we observe dilatations, because the system of own rocket S(2) turned to our system selected-basic S(1).
According to me, the reason for dilatation ("your" unfortunate relativity) is to rotate the systems !!, ie the system of the test body and the observer system, in the system passing in peace.
a) STR is a description of the rotation of systems (when uniform movement is always in some "stop-set),
b) OTR gravity is" parabolic "rotation of systems during accelerated movement. And how do you verify this statement (my) using those experiments from 1960 + 1971 + 1997 + 2010 ?????? How do you verify that the universe does not spin axially, (see erroneous Hubble), but unpacks, http://www.hypothesis-of-universe.com/docs/c/c_065.jpg ; Thus, the 3+3 dimensions of the space-time are unpacked, and it is unpacked "from each point" http://www.hypothesis-of-universe.com/docs/c/c_223.jpg micro-world (dimension foam http://www.hypothesis-of-universe.com/docs/c/c_168.gif) with those "points" from which space-time unpacking is on a square billion, and countless in the universe, So even in every point around the world, micro-vesmir (foam) unpacks into the form of a macro-world (with gravitational curvature of space-time around http://www.hypothesis-of-univeSe.com/docs/c/c_190.jpg or between bodies as stars and between galaxies) http://www.hypothesis-of-universe.com/docs/c/c_241.jpg ; Unpacking dimensions macro-ballast is also regular and irregular, chaotic .., is also regular and irregular, chaotic .., inhomogeneous unpacking of space-time → http://www.hypothesis-of-univeSe.com/docs/c/c_222.jpg ; It is not Hubble axial expansion; http://www.hypothesis-of-universe.com/docs/c/c_176.jpg . Why ? A) time dimensions curl, everywhere, always; B) the

pace of passage of time is not the same everywhere in the stop-up; C) maybe the pace of passage of time changes even during the aging of the universe; The science-physical questions never examined).

A clock is attached to each observer to each moving frame of reference to see what time is doing at the big bang. ((Clocks are just a mechanism by which we measure (intervals) some observed rate of passage of time and compare it with chosen "clock" intervals, units.)) We must trace the path through space and time back to the singularity. ((That's the "anti-expanding" time dimensions way.)). We trace a path called geodesics, which is generally the relativity shortest path between two space-time coordinates. ((What we call ourselves here on Earth and what is different in every location of the Universe...)). These are the grids we use to map spacetime. Remember that as we rewind ((time)), all points in space will arbitrarily approach each other before merging at T-time equal to zero. ((If after the Big Bang there was no "unpacking" of that "boiling foam" = plasma of dimensions 3+3D, this state would remain "for a long time", the "right-left flows of time" would remain "equalized"... foam would not "pick up" one direction of unzipping and therefore the passage of time would not occur..)). Well, that's like saying that all geodesics in the universe converge at the Big Bang singularity. In the same way, all lines of longitude converge to the North Pole, so that each geodetic traces earlier and earlier times as the Big Bang approaches the infinite clocks winding to zero, and then they all converge; and then what? well, nothing. All geodesics end at the Big Bang singularity and their timelines end there. Or they start depending on how you want to think about it The point is that there is nothing in the pure Einsteinian picture Before the Big Bang, ((wrong thinking, there is pure flat infinite space-time with no matter, no fields, no unwrapping of time, no unwrapping of space… ; all this will happen only after the big bang, when there will be a sudden change in the curvature of the dimensions...etc. etc. see hundreds of interpretations in HDV...))) because there is **no time** ((there is TIME, but it does not "run", there is no Observer, (which can also be a cursor on the network) which, according to "another Observer", moves along the time dimension as well as along the length dimension.)). a line can be traced there in this universe. This is called geodesic in its entirety and also happens in the singularity at the center of the black hole, all timelines end in the forward direction this time. The North Pole analogy is a good one and was used by Einstein himself. Lines of longitude end at the North Pole, and it makes no sense to ask what is north of the North Pole? from a purely Einsteinian point of view. There is no point in asking what happened before the Big Bang ((of course, nothing "happened" there, because there is no genesis, because there is neither matter, nor fields, nor expansion of space, nor "aging", i.e. flow the passage of time ..., it's not there, but the "state-of-being" is there before the Bang !)), or after reaching the center of the black hole? Okay, so I'm taking the time to explain something that I've already told you is wrong, but it's important because the extreme strangeness of the Big Bang singularity is part of what it's telling us. It is bad. Anytime you come across a singularity in the math of a physical theory, you have good reason to be skeptical. ((Have you wondered what a "singularity" looks like, i.e. an arbitrarily large location in an infinite flat Universe ??, http://www.hypothesis-of-universe.com/docs/h/h_051.pdf , i.e. that this "locality non-singular" can be in a state of different curvatures of dimensions than the surrounding infinite flat space-time ??!!)). It probably tells you that your physics theory is incomplete and that you are pushing the theory too far. That's what's happening here. We used general relativity to rewind the universe, but we already know that despite its incredible achievements, GR is an incomplete theory? At the crazy densities and temperatures ((which are properties of the multicurved state of space-time dimensions = boiling froth of dimensions)) of the Big Bang singularity and just after that, GR comes into dire conflict with quantum mechanics. http://www.hypothesis-of-

universe.com/docs/h/h_082.jpg We've talked about this conflict and its possible solutions before, but the result is that we simply don't know how the universe behaves under these conditions, but we do know , that pure general relativity is not a good description, http://www.hypothesis-of-universe.com/docs/h/h_082.jpg and so he should probably not believe its prediction that all spacetime has been compacted =curved packed to a single point and that Time began here. ((The "flow-flow of time" began, because the dimension of time began to expand, or from another point of view-preview: the observer began to move along the time dimension and thereby cut off time intervals...)).
OK. So what are the alternatives? Can we really track geodesics? and the timelines they embody during the Big Bang and beyond. If so, what will we find there? ((The location of extremely distorted – collapsed 3+3 dimensions of two quantities: TIME and Length, i.e. 3+3D space-time.)). There are several options and they deserve their own episodes ((HDV too…)) and we'll actually get to those soon. But to whet your appetite, first cosmic inflation may offer temporary relief from the singularity. Eternal inflation suggests that our universe appeared as a regularly expanding bubble http://www.hypothesis-of-universe.com/docs/c/c_239.jpg in an unimaginably larger continuously inflating space-time in that event than the Big Bang a period of exponential expansion that could last indefinitely, with its inflow pincers and bubble universes really early, There are also various possibilities ((HDV)) of a cyclic universe the first idea of a cyclic universe was the Big Bounce, in which the gravitational attraction of all matter in of space was enough to collapse again and then probably bounce out. Again, we now know that there isn't enough matter anywhere to prove this unless we bring in string theory. The Steinhardt-Turok model suggests that our universe floats in a higher dimensional space and lives on geometric objects called brain collisions between these brains initiate cycles of expansion contraction. Then there's Roger Penrose's Conformal Cyclic Cosmology, which is even weirder.
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(03)- because it postulates the infinite future boundary of an eternally expanding universe Looks like the Big Bang of a new universe Mathematically so our heat death is someone else's Big Bang? There are some less abstract ways to get a new universe out of an old one for example an extreme quantum fluctuation could initiate a new Big Bang given infinite time or The same amount of time could lead to all particles randomly converging back to the same spot Or maybe black holes birth new universes as in Lee Smolin's "Fecund Universe" hypothesis. There's a poetry to that last one. The geodesics approaching the black hole singularity Become the geodesics emerging from the new Big Bang singularity people love cyclic and regenerating universes They appeal to our sense of narrative which might be a reason to be wary of these hypotheses Now they also appeal to our intuition for causality Things happen because prior events caused them many of our ideas Just push back the uncomfortable something from nothing moments physicists have a thing or two to say about that from quantum fluctuations from nothing - Stephen Hawking's timeless interpretation of internal inflation that draws on the holographic principle all things we'll discuss in the future as we travel beyond the beginning of Space-Time. A big thank you to LastPass for sponsoring previous digital studios LastPass remembers your passwords for you by Auto filling your usernames and passwords LastPass is designed to store the count walkouts, which means you won't need to answer security questions like 'What is your favorite childhood pet's name?' or, 'what street did your paternal grandmother live on growing up?' they protect your data and give you the power to make your passwords impenetrable You could also easily and safely share passwords through LastPass if others need to access your accounts the service works on mobile sites and on apps for iOS and Android

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(03)- because it postulates an infinite future limit of an ever-expanding universe. It looks like the big bang of the new universe, mathematically, so is our heat death someone else's big bang? There are some less abstract ways to get a new universe out of an old one, for example an extreme quantum fluctuation ((or an extreme jump from 3+3D Euclidean flatness to maximum curvature to "foam" form..)) could initiate a new Big Bang in infinite time or The same amount of time could lead to all particles randomly converging back to the same place ((even a madman can't think that, there is about 10^{56} kg of baryon matter in the universe, which is about 10^{82} pcs, e.g. .protons)) or perhaps black holes give birth to new universes as in Lee Smolin's "Fecund Universe" hypothesis. There is poetry for the latter. Geodesics Approaches Black Hole Singularity Become Geodesics Coming Out of New Big Bang Singularity humans love cyclical and regenerating universes, appeal to our sense of narrative, which may be a reason to be wary of these hypotheses. Now they also appeal to our intuitions about causality. Things happen because previous events have triggered many of our thoughts in them Just push an inconvenient something out of nothing when physicists have something to say about it from quantum fluctuations out of nothing - a timeless interpretation of Stephen Hawking's internal inflation that draws on the holographic principle. things we will discuss in the future when we travel beyond the beginning of spacetime. Big thanks to LastPass for sponsoring previous digital studies LastPass remembers your passwords for you by auto-filling your usernames and passwords LastPass is designed to save the number of exits, meaning you won't have to answer security questions like "What's your favorite name childhood pet?" or, 'what street did your paternal grandmother grow up on?' protect your data and give you the ability to make your passwords impenetrable You can also easily and securely share passwords through LastPass if others need access to your accounts the service works on mobile websites and apps for iOS and Android The service provides unlimited password storage. Other service options are available. Click the link in the description below to get started today. ((Summary: Time is an artifact-quantity-phenomenon of Existence (before the Bang and after the Bang)..., so it does not "run". But after a material object (or a cursor, etc.) begins to move along the time dimension), the shift "after of time" cuts off intervals that can be observed and evaluated "as the flow of time".))
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JN, kom 25.05.2022 ; translation made on 24/08/2022