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What Happened Before the Big Bang?

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01) We actually have a pretty good idea of what might have happened before the Big Bang. That is as long as you define 'The Big Bang' as the universe's early hot dense expanding state that's well described by Einstein's equations. That picture of the Big Bang is very solid, down to about a trillionth of a second after the supposed beginning of time. We can make good guesses down to about 10^(-30) of a second, but did anything happen before that? Well, maybe .... everything.
(01*) 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 ; http://www.hypothesis-of-universe.com/docs/aa/aa_067.pdf ; http://www.hypothesis-of-universe.com/docs/aa/aa_089.pdf and more and more links The universe almost certainly did not explode from a singular point.* **O.K**. The Big Bang is a "change of state" from the previous to the next. The previous is a 3 + 3D flat Euclidean infinite without matter, without fields, without the flow of time and without expansion. Only when Třesk brings a change in the curvatures of the dimensions of space-time… does the "locality" of an extremely curved state of dimensions occur and they (according to the principle of alternating symmetries with asymmetries) expand, better said they expand; in the first phase of this World (after the bang) is the "boiling vacuum - foam of dimensions = plasma. A… and genetic development occurs (as described elsewhere). From another point of view, in fact, curved crooked space-time = foam of dimensions 'is created all the time and everywhere and always on the Planck scales throughout the existence of the Universe…, the boiling vacuum of dimensions is still around us and… and then space. (see explanation elsewhere) Now, we covered that misconception recently. These days, the best accepted description of the time before the Big Bang is given by inflation theory. * According to HDV, the time before Třesk "was" but did not run. He was and is before big-bang as a "state-quantity-phenomenon. Time begins to run only when the curvature of all time dimensions begins to "expand". The fact that there are more than one has never been studied. The pace of the passage of time (as we know it today, on Earth today) may not always have been the same in the past history of the Universe. Unpacking čp dimensions happens differently for length dimensions and differently for time dimensions. If we believe (if we try to believe) on the state 3 + 3D čp before Třesk as "motionless-static-immutable", then it is possible that „poTřeskový state of curved dimensions čp" "" "" floats "" "" (!) in that basic raster-network-yarn 3 + 3D, because "our" state of global cp and cp at the micro level up to plank scales is crooked…; Curved state 3 + 3d "floats" on "flat" 3 + 3D; The curved state of čp realistically describes OTR, and the quantum = curved state (foam curvatures) is described by nuclear physics. So from another angle of vision "we-matter-Earth" we move "over time", over the time dimension of the raster that stands…. Our time dimension expands .. The idea is that the energy trapped in the so-called "Inflaton field" caused exponential expansion of space. This was the 'bang' in the Big Bang. * HDV says that

in bang there was a *"maximum change in the state of space-time from a state of totally flat to a state of totally curved - plasma"*. So not expansion, but vice versa. There was a contraction of the "locality" of space-time in an infinitely flat network-thread 3 + 3D space-time into a "locality" finite with infinite curvature, which immediately expands, exponentially. http://www.hypothesis-of-universe.com/docs/c/c_239.jpg In previous episodes, we looked at why cosmologists think we need inflation and what could possibly cause it. That last one is definitely worth a watch if you haven't yet, because today we're going to peer further back in time and explore a stunning implication of inflationary theory. * STR is also worth paying attention to and exploring in its statement on dilation: "the pace of time is the fastest on Earth. Elsewhere, it seems - Kulhánek writes - that the pace of time is slower and slower = time dilates to zero as the velocity of the body approaches. This statement can be made by any observer in the universe. ! According to this statement, it should logically be true that at any point in the universe there can be any pace of time, but as this "point = observer" begins to observe other bodies in motion, it will perceive = observe (only !!!! observe) dilatation on these moving objects. No one has ever proven (Professor) that it is the fastest pace of time in the universe on Earth or that this "earthly pace" is the only fastest pace in the entire universe. See, if we accept that inflation happened at all, it's hard to escape the conclusion that it never actually stopped. * Or a new finding that the universe has been UNPACKING since the Bang according to some involute → http://www.hypothesis-of-universe.com/docs/c/c_239.jpg ; http://www.hypothesis-of-universe.com/docs/c/c_357.jpg … And maybe even unfolds still "from a boiling vacuum" and still all around us, yesterday, today. We - our position of the Earth and our size - are our magnitude between the "planck length-interval" and the distance to the horizon of observability beyond which it is "no longer visible", so-somehow in the middle, right? → http://www.hypothesis-of-universe.com/docs/c/c_017.jpg And in fact, ?? our universe is but one bubble among countless others in an eternally inflating greater universe. Cosmic inflation, if it actually happened, was driven by the inflaton field, ?? which had the bizarre property of containing * and is it certain that it was so? a ton of energy even in the absence of particles. * This is a more meaningful and logical vision that if matter and the physical field are "built" from the dimensions of space-time, that is, in a style-way of "curving" the dimensions; that is, that "curvature of dimensions" is principled for the construction of fields and matter, ie a mass-creating phenomenon, then it easily follows from this logic that energy is a state of "curvature of dimensions" and therefore even dark energy is born in "foam of vacuum", which is foam of curved dimensions and therefore the energy can increase "out of nothing", ie it is born in that foam of vacuum and thus the density of that energy is constant even though space-time expands-expands. It had a nonzero vacuum energy. Well, see how the new science is approaching my 40-year-old HDV Now, in a recent episode we talked about how such a field = foam of 3 + 3 curved dimensions could drive exponential expansion. But we stopped short of discussing what the field actually is and what the real implications are of its existence.* ***The "principle of curvature"*** of dimensions is the cause-reason of the origin of matter and fields… (not the other way around, Professor, as you claim that space-time arises from matter and therefore that without matter space-time would not exist…, you are wrong !!); space-time as 3 + 3D plus two of my postulates = principles, + still ***with the principle of alternating symmetries with asymmetries,*** that is enough for us to exist EVERYTHING, to position it ..; the other "subordinations" will arise "themselves" from the **genesis** just said. Before we make any real predictions about the behavior of an inflating universe, we probably should know more about the field (what field, inflantons?) that drives it. To start with, you need a particular type of field to cause inflation, something called a scalar field. This is actually the simplest type of quantum field because it's described by a single number, a scalar everywhere in space.?? Other fields like the particle field or the electromagnetic field are described by multiple components and vectors instead of single

numbers. We know that scalar fields exist, or at least one does. That's the Higgs field which gives elementary particles their mass. * No, no ... my opinion →
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The inflaton field would be another such scalar field, or it might even be the Higgs field. Physicists are still arguing over that one * **Did physicists read HDV ?** I mentioned last time that quantum fields can hold energy without actually having particles. They do this through a process called self interaction. You can think of a field with a high field strength as being full of virtual particles. * O.K. Photons "flow" here and there between the electron and the positron.. These are ephemeral vibrations in the field * he sees how physics already resembles my vision of "boiling vacuum = foam of dimensions", where the "principle of alternating symmetries with asymmetries" takes place, etc. that are constantly tugging at the field as the field tugs at them. This self interaction gives the field some potential energy.* **The "principle of dimensional curvature"** (for the properties of electric particles such as mass, spin, charge, etc.) is stronger than the Higgs mechanism It's potential energy because the field would much rather reconfigure itself into a lower energy *..but the universe 3 + 3D expands "against" this reconfiguration state. In which case, that stored energy would be converted into another form, for example into real particles. Although scalar fields are the simplest, they can exhibit complicated relationships between this potential energy and the field strength. In our last inflation episode, we looked at the case of old inflation proposed by Alan Guth in 1979. Guth's idea is that there's a local minimum in potential energy that allows the inflaton field to get stuck in a false vacuum state.
02) When that state decays, (inflated field) potential energy is released as real particles, * well, let's see how it starts to look like HDV, ie "balling" of dimensions čp to geony = elem. particle ending inflation, and re-heating the universe in an expanding bubble. The random nature of this version of inflaton decay means that many such bubbles should form, ie. multiple universes exist.* ?? I am skeptical of more universes (our universe will gradually "expand" "at infinity" and the expanded dimensions will "connect" with the basic flat Euclidean 3 + 3d space-time But we also saw that there were problems with this approach. Old inflation predicts empty firewall bubbles that look nothing like the early phase of our universe. A more promising idea is something called slow roll inflation * And let's see, even here, new physics is approaching my vision of unpacking space-time, for example according to the involute (and it doesn't have to be exactly the involute !!!, it can be a chaotic unraveling of curvatures http://www.hypothesis-of-universe.com/docs/c/c_362.jpg) This was proposed by Andrei Linde, Andreas Albrecht and Paul Steinhardt, in 1982, just a few years after Guth's proposal. The idea of slow roll inflation is that the inflaton field isn't stuck at a local minimum in the potential but rather it's on a very weakly sloping plateau leading towards a deeper valley. In that case, the field strength would very slowly roll down that slope. As it did, the energy would drop very very slowly. That would still give us our near constant energy * certainly, if a new space-time is "born" on the Planck scales, then the vacuum foam and thus the dark energy is born there… and the density is constant in the flow-flow of time density needed to power inflation and then, as the roll sped up towards the valley, inflation would end. But it wouldn't end as a random process, it wouldn't require

quantum tunneling to get started. Instead, the entire region of the inflating universe would approach this minimum at the same time Inflation would shut down smoothly and the universe would be reheated everywhere all at once. This gives us the expanding hot dense universe that we know and love in our Big Bang model. But if slow roll inflation stops everywhere at once, how does it last forever and how does it give us multiple universes? Before we get to that, I want a quick word on why the Inflaton field should have one potential energy curve over any other. Now, the behavior of this field depends on some unverified physics But a suitable inflaton field fits with some grand unified theories. Those are theories that combine the strong nuclear force with electromagnetic and weak forces. As well as theories which also unify gravity, like string theory. These theories predict phase jump transitions in the behavior of fields as the temperature of the universe changes. As the universe cools, different vacuum states * that is, different states of curvatures of the dimensions of space-time on small scales !! can appear possibly trapping the inflaton field.* ?? What does it mean that different states of vacuum can "**capture**" an inflantoned field?? Very flat potential energy slopes are also possible in these theories, enabling slow roll inflation or a combination of both. The detailed physics requires yet more episodes, * I don't know my "detailed" physics for detailed HDV either. But which of the two of us lacks more in the "details" of his physics ??, I'll leave that to the judgment of sharper physicists. so, for now take my word for it that inflation fits some theory even if that theory is also entirely speculative. O.K., which can also be HDV As speculative as inflation is, it does make some predictions and some are even testable. I mentioned that quantum fields *fluctuate* due to the intrinsic randomness of the quantum world. * Although I don't quite understand quantum fields, surely qvant fields are close to a kind of "quantum foam", which are the **crooked** dimensions of space-time. And we're still in HDV. As the inflaton field rolls down the potential energy hill, the field strength should fluctuate slightly.* The “slightly” fluctuations are in harmony with the vision of alternating symmetries with asymmetries. That means some regions of the universe would finish inflation a little ahead of others. * Oh, oh, astonishment, I hear this for the first time that the universe "has areas" where maybe everyone has a different age, age, or a different "opening" of space-time ..., here you copy my HDV And that will lead to very small density *(and fluctuations fall "under the law" of alternating symmetries with asymmetries) and temperature fluctuations in the matter produced after inflation. * Small flies are a "remnant" of chaotic plasma, which are fine curvature of dimensions where the "substitution principle" works and thus already there in the microwave background "swims" packages = Klubík = clones with tightly crooked-wrapped dimensions, and there are billears up to Billears on Billears and conglomerate to the star and galaxy, what the crooked elements have remained forever, they are elem. particle. Genesis is the phenomenon of another is the reduction of mutual behavior-interaction of elements ... etc. / See HDV. And we see those fluctuations in the Cosmic Microwave Background. These same fluctuations collapsed under their own gravity to become the first galaxies. In fact, this is perhaps the best evidence we have that inflation is plausible, it can predict the pattern of temperature fluctuations in the CMB. They should, according to inflation, come in all possible sizes on the sky and be evenly distributed in abundance with giant fluctuations as likely to occur as tiny ones and all physical sizes in between, and that is exactly what we see in the CMB.* O.K., However, the prism of "crooked dimensions of s-t" But seeding all of the structure in our universe is probably the least impressive thing those quantum fluctuations did. They also give eternal inflation and multiple universes. * It give your equations, not the universe ...; It give your equations, not the universe ...; Multiple universes don't give, I don't believe it, but if it is said that "more space-time", then yes; Yes maybe it has a universe "more time periods" that floats. They float different curvature dimensions in other codes. In slow roll inflation, exponential expansion should grind to a halt over large regions as the inflaton field decays As I mentioned, small

fluctuations in the Inflaton field would lead to slight differences in when the inflation ends from one point to the next. But quantum fluctuations come in all sizes and a rare strong fluctuation would force the inflaton field back up the potential energy slope, causing inflation to last a lot longer in that spot. Such fluctuations would be extremely rare and so you wouldn't think they'd count for much, but remember, Inflation causes exponential expansion.* And realize that expansion may not be linear or exponential and that no one has not yet considered the "More pleasant" space-time unpacking ... To further up the slope, the inflaton field gets pushed the faster that expansion. So, and up your fluctuation in a tiny patch of space would very quickly outgrow its surroundings; producing a new inflating region.* ? like, like another universe? That region would then continue to decay spawning new universes, I see but also spawning new inflating regions.

03) The result is stunning; inflation never stops, but rather forms a fractal structure of infinitely expanding space in dispersed with bubble universes of all different sizes. And to get this started, you need a speck. A fraction of the Planck energy within a Planck volume. A millionth of a gram in a space 10^(-35) meters across should do the trick. Assuming a quantum field of the right type and that speck will start inflating. The exponential nature of the process will take over and the speck becomes infinite universes. Okay, cool story, bro. Admittedly this all raises a few questions. How plausible is this mysterious inflaton field? * Finally, start thinking about the "curvature of dimensions", ie that this phenomenon is the cosmic-creative act Can eternal inflation last infinitely into the past as well as the future? What happens when bubbles collide? There are also deep possible connections between inflation and string theory and with the holographic principle, as described in one of Stephen Hawking's last papers. * Stephen is not infallible either Good material for the eternally expanding future library of PBS Space Time. ☺ Hey everyone. * Hi from me to those who are thinking about HDV So, summer travel has kept me from doing comment responses for the past few episodes. On the plus side, I learned how to kite surf but now that I'm back on firm ground I'll respond to questions from two episodes.* I wonder if you will also (sometimes ... under 30) answer my vision for HDV! "Did time start at the Big Bang" and "What caused the Big Bang, the real physics of inflation" A couple of people mentioned George Lemaitre, who predicted the expansion of the universe before Edwin Hubble's observations. * This was an amazing feat, but it should be re-evaluated to see if the Hubble-linear equation is wrong, meaning that the correct observation is misinterpreted. Lemaitre was a Jesuit priest and astronomer physicist. He realized that Vesta Slifer's observations of receding galaxies could be explained by an expanding universe and solved Einstein's equations to show this. * I'm a bad mathematician, so I wonder if "my vision for un-packaging **fits** into Einstein's equations. Lemaitre doesn't get as much credit in popular accounts as Hubble and that's definitely unfair. Dtto HDV But the reason Hubble gets most of the credit is that before Hubble, we had no idea what O.K. the distances were to Slifer's galaxies and so we couldn't properly test this expanding universe hypothesis. !! Pup314 asks if the reheating of the universe after inflation is what gave us the cosmic background radiation. Well, not directly. The CMB was released about 400,000 years after the end of inflation when the reheated universe first became transparent. It was around 3000 Kelvin at that time. The reheating i'm talking about happened right at the end of inflation, ?? which is basically corresponding to the beginning of our universe. Then an ocean of inflaton particles * inflaton = fabrications released by the decaying inflaton field turned into extremely energetic particles and radiation. How energetic? Enough to give the universe a temperature of 10 to the power of 27 or 28 Kelvin. That energy would then end up in the cosmic background radiation photons, but not for a while. Some of you asked how our cosmic inflation episode explains what caused the Big Bang, * Hawking claims that it "originated from Nothing", I have a hypothesis of a "change of state" of the previous state of the Universe, ie a flat infinite 3 + 3D s-t (spacetime) without matter, without

flow-flow of time and without expansion, to a state of "post-shake", ie extremely curved locality (non-zero singularity) of dimensions čp to the state of "plasma" and… and you already know it… genesis according to the principle of alternating symmetries with asymmetries which is what we claimed in the title. Also, the standard Big Bang Theory doesn't explain the initial expansion at all, * I explain in HDV a good meaningful interesting version, to which I have not had a reaction of an educated physicist for 20 years (if the "educated" read only "educated" theories, then I am still unlucky for a long time…) it includes an expansion rate in its initial conditions and then tries to explain everything that happens afterwards. Inflation actually gives a physical reason for the universe to have started with a rapid outward expansion rate in terms of pretty well understood physics. So, inflation doesn't explain where the very first speck of space-time and energy came from but it does give a potential explanation for the 'bang' part of the Big Bang. ☺ Dominic H quips "Did time start at the Big Bang? * Time is an artifact-quantity. Time is not running before Bang. Time begins to run when the time dimension "develops-expands" begins; respectively, when "something" begins to wander along that time dimension = to shift, and that is we-humans. Before Bang, the time dimension is flat, it can't "run". After the Bang only when it is very curved (in foam) the curvature begin. Let me guess depends on your definitions of "Did", "Time", "Start" and "Big Bang" " Ah... Exactly right, Dominic! Bad science starts with bad questions. * O.K. But who knows what is and when is "" "" bad "" "question? What's the meaning of life, the universe and everything? 42 for the right definition of life, the universe, and everything. It may seem pedantic and nerdy but the more precise the question the more useful the answer. In the case of Big Bang, many scientists now mean the period of regular Hubble like expansion that followed the initial **kick** and we think that kick was caused by inflation.* My vision about "change status" is a better vision than "**kick**-bang" To those of you surprised to see me out in the real world in our recent stellar series, don't worry, they caught me again and took away my kite

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