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Julian Barbour on "The Janus Point: A New Theory of Time" | Closer To Truth Chats

Julian Barbour na téma „Janus Point: Nová teorie času“

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My comment is in red, translated by google-translator which can be quite a distorted description-interpretation

00:00

(01)- i was on a radio program with the astronomer royal in this country and and i said frankly the expanding universe **stinks** ? **it's not expanding it's changing its shape** * **That's a better opinion. It is closer to my version that the Universe is unfolding, its curvatures of dimensions unfolding after the big bang were in a state of "boiling foam"**. julian it's great to see you i checked it's been almost a decade which gives me some sense that maybe uh time is some kind of an illusion and having been sheltered for months where wednesday seems the same as sunday time no longer seems to be flowing in my life so i'm almost becoming a believer in your radical theory of time um i in all seriousness though i i have uh read the your new book the janus point the new theory of time and uh i was immediately struck by the um the vastness of your vision last time we spoke we were focused on time which was radical enough in terms of your approach but now from that you've built a **a really a remarkable superstructure that engages virtually everything** * so what i'd like to do to begin is give you my sense of the major ideas that you have um and then you go through it correct me get we want to get the overview and then we want to go into each of the pieces to give the uh justification **or at least the reasons for the speculation** so let me i have roughly five points uh a) first that **time does not flow** and it does **not have a single direction** past the future second the history of the classical universe is a succession **of shapes it's an important word in your work shapes** from which the notion of duration of what we may think is time emerges three the history of the universe is not one of increasing disorder which of course is the traditional and and conventional wisdom and science increasing uh **entropy** but rather you say **of the growth of structure** * **that is: the higher the complexity of the structures (curvature of dimensions), the less clutter (?) yes? that is, as the curvatures expand, the entropy increases, the complexity decreases, yes?** so we're going to need to talk about structure four you have a what you call a **new vision of the big bang** which is you define as the Janus point because time then flows in both directions the janus being two faces it flows in two directions from the janus point and it's driven by you say the expansion of the universe and the growth of order whether it's **galaxies planets** ; http://www.hypothesis-of-universe.com/docs/aa/aa_147.pdf ; http://www.hypothesis-of-universe.com/docs/eng/eng_054.pdf **analogy with my idea that in**

the world "right" unfolds and in the anti-world unfolds "left"... or life and then the fifth and final point is that you challenge the conventional wisdom that **the universe and all reality is headed for heat death** * From the logic of the matter of my idea that .. that before the Space was space-smooth, flat, Euclidean and after the total the opposite, and that after the big bang, this extreme curvature of the 3 + 3 space-time began to expand (expand into a global and pack into small localities = packets - cocoons presenting elementary particles of matter), so from this logic the space-time will scale up "for a very long time" (maybe it won't be up to the Euclidean flatness) until it reaches the border of a new change, the new Big Bang... and repeat the situation in the new version number 2 which is not dying by heat it's it's the death of heat so that there's a a very bleak future where nothing can happen because everything is totally homogeneous and uh and as a result of challenging that you say therefore life can expand without bound which **is a remarkable statement** * And a wrong statement. No, life can't expand. After the Big Bang, the "order" is the GREATEST, a state of homogeneous chaotic "boiling" foam of curved dimensions, and this "order" (least entropy) changes to "disorder" (from quarks, boson leptons to atoms, then molecules and compounds... to DNA), ie to the higher and higher complexity of compacting of curved dimensions in the genesis of complexing systems, then in the plasma "local" packs are "born" from coiled dimensions, which "float" in less curved environment..., then the genesis continues in the direction of "quality times quantity constant", which means that the older the universe, the less complex matter decreases and transforms into more complex and complex structures, with: the more complex the structure, the less and less it has throughout the Universe.

http://www.hypothesis-of-universe.com/docs/eng/eng_009.pdf . Pyramidal genesis of mass complexity. Quality-complexity times the quantity of complexity is constant. $A \cdot B = 1$; hyperbola. And we get to "our position", in the time of "now", where there is no more complex matter in the whole universe than there is on Earth. Geometrically, we are not the center of the Universe, but in terms of "the complexity of matter - DNA, etc.," we are at the tip of the pyramid, "the center of the Universe." No aliens have reached our peak... and it contradicts virtually everyone else that i know so how did i do with the overview and give me your sense well i would i would say it's that's a fairly good overview i would just put in a caveat at the end about life going on forever the the important word is is can or perhaps one even should say could um because uh that's really in speaking in normal terms that's the very distant future * The pyramidal genesis of the assembly of material structures, of course, continues..., but so far only here on Earth. How can I believe that elsewhere in the Universe in the same pyramid of evolution, a parallel "complexity of matter" will arise (later than on Earth), from which "another intelligence" will evolve? and it will catch up with us. ? Why does everyone say we're catching up with some higher civilization elsewhere? When it may be the other way around. (!) http://www.hypothesis-of-universe.com/docs/aa/aa_037.pdf http://www.hypothesis-of-universe.com/docs/eng/eng_009.pdf and really all sorts of things could happen before we get there speaking in conventional terms sure but uh you know we have a big rip or all sorts of things that people talk about uh under understood but the fundamental point is that the universe is not heading inexorably without any possibility of of change towards this um elimination of heat **or what's called heat death where everything is totally homogeneous** * "What all"? will be homogeneous ??? what? mass? and once that happens nothing interesting can happen anymore that's quite correct my belief is that there's no need for **variety** to stop increasing **variety can go on increasing forever** * If diversity is the same as complexity, it grows but does not increase in space, on the contrary: First there was hydrogen in space, (73%) then helium was recruited (23%) then lithium (18%) and... and less and less that complex matter. Today, the most complex matter is the LEAST in the entire history of the universe..., that is, diversity = complexity increases, but it is getting less and less in the whole Universe that is that is entirely possible so that that's a super important point

* But there is less and less of that variety in terms of complexity in terms of quantity and it flies in the face of pretty much all of our mutual colleagues and their views which i which i know you take as a compliment not a criticism well it's not it's not quite against everyone people that the key thing in this is is the question of ratios quite a lot of modern cosmologists do say that there won't be heat death but what they say is that the the density of energy will decrease * ? The energy density of the vacuum is constant..., because the curvature of the dimensions on the Planck scales is still "boiling" = foamy. One of the Principles of the World is: every crooked state of space-time dimensions (3 + 3) is in the form of fields or matter, but all of all that we ever are aware of really is is contrast is densities different brightnesses i mean as i look at your face uh one side of it is brighter than the other and i noticed the difference there so if there is always variety in that sense that in some places intensities are greater than other even if the overall intensity is going down there is still some reality there there is variety this is the key thing if there were no variety we would we would not be able to think about anything we could not have any sense of science so it's variety that's the crucial * diversity occurs with mutual combinations curvatures of spatiotemporal dimensions and those combinations are infinitely many (just look at the well-known Mendeleev table of elements - just make a change in the "package of topological-geometric curvatures of dimensions" and there is a new element) thing and that depends upon ratios not upon absolute values okay that makes sense but if if the trend is towards this homogeneity * homogeneity of what? then take you know at the asymptote take it out as long as as long as you can eventually it will depress the capacity on a continuing basis to create variety and eventually become zero

(02)- by no means necessarily i mean the you can go on creating uh differences all the way just think about ordinary real numbers with their decimal expansion the decimal expansion can go on forever * which does not explain "your" view, vision, idea, the genesis of the Universe áte you are looking with fake glasses so there's always going to be a difference between one decimal place and the next one so to speak so you you could have two you could imagine two real numbers * why use numbers? when I can directly use dimensions, namely their "curvatures", countless kinds of curvatures looking at their decimal expansion as you go along there's always a difference between them * a difference in the shape of curvatures so so there's absolutely no reason for variety to be killed off just because uh one's got an idea of an intensity * diversity is not the same as complexity; these are slightly different i think a lot of the problem comes from not thinking about the entire universe all around us we see measuring rods and clocks and we think they are absolute but there can't be a measuring rod outside the universe we have to look for measuring rods within the universe and if the things we take to be measuring rods there are some that are so long as long as that and there are other ones that are that long there'll be a difference between them even if you might imagine that they're all getting smaller but that difference remains * your considerations are in the intentions of "intervals", nothing against it, but also think in the intentions of "curvatures" of dimensions it's that ratio that is always the one that counts two is always less than three your analogy to the real numbers and how they work uh is it supports your point but i wonder is there a fundamental difference between the abstract quality of numbers and the reality factors of matter for example you know we talk about uh the uh plank lengths and so as things get smaller and smaller if they hit a hurdle call it a plank length* or whatever uh that that changes the physical dynamics and so the the the analogy to the abstract abstract numbers to physical matter is not direct it's not direct but we don't really know what happens at the plank length* which is the interval on the length dimension (!) at the moment * which is the interval on the time dimension (!) the plank length is ultimately determined really by the frequencies of the cesium atom * (length interval determined by time interval) because that's the key thing in

metrology and we don't really know what happens i mean certainly cesium atoms don't exist down at the planck length that's for sure so it's it's it's uncertain **i mean the the fact is all scientific data ultimately come in the form of numbers** * (oh yeah... oh yeah; numbers are just "intervals" but more important than "your numbers" are dimensions = quantities = artifacts = the phenomenon of the Universe. I explained to the students in 8A on industrial engineering what is the difference between mathematics and physics, that mathematics, these are operations with numbers..., physics, these are operations with physical quantities, or **physics is : "number times physical quantity"; math is: "number times number"**. and if there are differences between numbers if there are ratios uh then there's there's meaning there is always meaning in ratios okay so let's do this let's go through each of the points that that uh i've put together sort of the big categories that that you have and and **and give me a sense of why these things are true HDV** i think everything i said uh is is uh contradicts the conventional wisdom um there are people i'm sure who agree with you but so each of these points let's start with **with your concept of time that it doesn't flow it does not have a single direction past the future this is something you've worked on for for decades ??? and and are in fact a a world standard on this but let me hear it afresh so the the first point about time : not uh not necessarily flowing in only just one direction first** * Yes, in chaotic foam blowing dimensions = plasma, http://www.hypothesis-of-universe.com/docs/c_c_168.gif ; Time is also running chaotically, so forward and back, so it has an arrow "towards right" and "left". At the moment when this plasma will be unpacked (only 3 + 3 'global dimensions are expanded), Time is also running chaotically, so forward and back, so it has an arrow "towards right" and "left". When this plasma starts to unpack this (only 3 + 3 global dimensions are expanded, there will be "**pack the ball of dimensions**", the local small ball of Planck's sizes, and this will be elementary particles (quarks, leptons, bosons,) What they further pack together together, conglomerate into baryonic elements, mesons, .. and further into atoms, molecules, compounds and higher compounds inorganic chemistry, organic chemistry, biology, up to "equation of everything = DNA". http://www.hypothesis-of-universe.com/docs/aa/aa_037.pdf . In these "material packages", the time dimension is coated so that "is in the package time for a small interval" against a global arrow, an arrow that "expands" global raster, stage, network, a 3 + 3 diameter. So the time does not only have to go in one direction - on the expanded dimensions "running" time in one direction, but in matter, in those packages of club elements, dimensions of time curved collapsed and therefore are "there" intervals with opposite arrow. Ad 02) in Antiscript (which is the "second symmetrical quadrant" of the same universe) is the arrow of time inverted and vice versa "there" decreases the dimension of time - it is not yet to explain that it is meaningful of all all the known laws of nature at least all the ones that could possibly count in determining what is called the arrow time they are uh they don't make a distinction between the direction of time the laws work the same way in both directions and this has been the great mystery really since the discovery of the laws of thermodynamics around 1850. so but what people always thought about i think the key thing in all of this that is why people have not realized the proper way to think about this is that the laws of thermodynamics were discovered through the behavior of steam engines and what a steam engine must maintain keep the steam in the cylinder box in the cylinder and so i say that all of the conceptualization of all of these issues has been for steam in a box or a system in a box and a system in a box behaves completely differently from one that is not you can i mean people say you start off with with uh shall we say a drop of liquid in the corner of a box that is a very low entropy state the if it's in the box the liquid will will it might even be a little bit of ice initially the ice will become water the water will evaporate and the water molecules will spread out over the whole box that's the classic story of the increase of entropy however if there is no box there and that ice is out in space and it melts it will behave in a completely different way it will go it will expand **that in fact actually what it typically does is expand like an expanding universe**

but if at the same time these atoms can interact gravitationally they would cluster together and form structures * Author Barbour basically talks about what I also talk about: "First "Status after the bang plasma = chaotically blazing foam 3 + 3 D space-time is expanding and also collapses - both in parallel. A) Unpacks the global form of a few curve space-time (from the state of strong nuclear power, through weak nuclear power, electromagnetism to gravity - these are states gradually expanding the correction of space-time) B) In the chaotic foam 3 + 3 d "packed" packages-clubs-cocoons into topologically accurate shape and are then **the elements of matter**, which continue to interconnect "" parallel "" ie. More complex conditions in atoms, molecules of compounds, etc. .; and conglomerate "" into series"" such as stars and galaxies. and this behavior in ein newton's theory of gravity was already clearly recognized in 1772 and when that happens if you just look at newton's theory

(03)- as long as the energy is not negative so zero energy or positive energy you find that the system grows in size in both directions of time ??? there's always a minimum size where the system is most uniform the distribution of the particles is most uniform and in both directions the structure grows * **what is meant? So that the structure is more complex or more material,, ???** so this aspect of newton's theory nobody's recognized it although it was discovered in one of the most important papers by the mathematician lagrange in 1772 and it was that insight actually as recently as 2012 which made me realize this could **be the explanation of the arrow of time** * **I have one ear** the the the approach that you're you're using on this um is the fundamental difference between a confined space and a space that has no has no bounds um it's not clear to me why to the um to that individual space where that kernel of ice is is is is uh evaporating why that's different than the closed box at some point it will but initially it would be the same it depends how big your box your conceptual box is well yes actually in the initial stage of the ice melting and the water then evaporating it is actually rather like that happening in in empty space uh and it would look initially like an expanding universe but it's the it's the box that is so important that is where the the idea that entropy is bound to increase eventually comes right so you you have uh introduced a new concept called **antix entexy** * ?? (what is it ?) if i pronounce it properly yeah taxi okay get my get my emphasis in the right place um and you define this kind of the **opposite of entropy** * **increase in complexity...**; **this is what matter does from the very beginning, that "complexity grows by conglomerating" structures...** because it's something that um it it kind of helps create structure ***create a more complex structure** or it decreases it it's sort of everything you thought about entropy and turning it upside down that's that's quite correct and and i think it's uh the people have said for a long time that gravity is anti-thermodynamic because if you start off with a uniform distribution of matter subject to newton's gravity the system will **will clump well** * **clustering I don't think it's the same as "bond conglomeration" or "packing dimensions" into cocoons-geons-packages, it's not the same** this is this is the phenomenon i'm talking about and so to save the second law of thermodynamics everybody is so determined they must save the second law of the dynamics it cannot be violated they say gravity is anti-thermodynamic and it increases when it grabs the entropy under gravity increases but i'm saying actually stop and think actually what it's doing it's becoming more special i mean uh i mean if you look around the universe it looks very special it doesn't look disordered at all i mean the fact * **O.K. there are systems where entropy does not grow, on the contrary it decreases and "there" there is a "complexing of structures"** that we can talk to each other we can go out with telescopes and look at these fabulous galaxies and things does that look like disorder tell it to the marines is all i can say look i loved your analogy because the typical um a way to describe in lay terms the expanding universe is a balloon that's that's expanding and so dots on the balloon get further and further apart as the expansion * **a better description is that they are balloons, millions of balloons in themselves from the smallest to the largest as "Russian matryoshka dolls", not that the**

Universe is "on the surface of one balloon" occurs but but you characterize it as as coins which are solid and immovable that are kind of pasted on the balloon so within the coin there is there is structure and that that that there's * **Sure. The dots also "retract" in the axis of "balloon radii" and the way of this expansion can be "unpacking nonlinear"**

http://www.hypothesis-of-universe.com/docs/c/c_358.jpg ; http://www.hypothesis-of-universe.com/docs/c/c_242.jpg ; http://www.hypothesis-of-universe.com/docs/c/c_241.jpg ; http://www.hypothesis-of-universe.com/docs/c/c_170.jpg ; the unpacking of the "initial chaotic foam" of crooked dimensions takes place not "from a selected point in that foam", but from all points in that foam "at once" ili it also unpacks.... it looks like the "big-bang" was still here - next to us in the Podplanck scales and there is still another 3 + 3D space-time being born by that **mini big-bang** and... and immediately unpacks... http://www.hypothesis-of-universe.com/docs/c/c_081.gif no disorder there even though those coins may be getting further and further apart that's quite true the the thing that it all comes back to ratios the ratio if you take the diameter of the coin and divide it by the distance to the next coin that decreases as the universe uh . **The universe is not on a balloon-surface, it is in a sphere...; why do physicists complicate it?** ex in the normal terms as the universe expands that's when people say the universe is exp i was on a radio program with the astronomer royal in this country and i said frankly the expanding universe stinks it's not expanding it's changing its shape what it's doing that is the only objective truth it is changing its shape * **both linearly and nonlinearly** http://www.hypothesis-of-universe.com/docs/c/c_240.jpg this is all that the astronomers observe so that's your second big point that the **the history of the universe** is a succession of a succession of shapes * **of shapes not only of matter, but of shapes and space-time itself...**, because even from the beginning , on the photon) and the shapes of space - time are different on the Planck scales and different in the galaxy, the shapes are different in every atom, in every molecule, in every compound (eg hexagons of carbon in hydrocarbons, or even the DNA with its shape). **Yes, the history of the universe is a sequence of sequences of shapes** — all of which adds to the idea that matter is also composed — built from the dimensions of two quantities, "Length" and "Time." Whether I reach into any category of physics, astrophysics or cosmology, everywhere my HDV is more in line with good knowledge than to "squeak". It is therefore unbelievable that physicists do not notice my HDV, they even get angry when it is offered to read and they are silent if they read a fragment from HDV. This is the greatest mystery of physics in the last 40 years. and these shapes the relationship between them is what gives us duration and then our sense of time correct and it's and there's also no shadow of doubt that these shapes are getting more structured and more interesting* **the shapes of matter are more and more structured, but even the physical fields are interestingly structured** i mean there's no shadow of doubt that when you go back near to the big bang the universe looks very uniform * **yes, "homogeneous foam of dimensions", and although it is chaotic it looks uniform...**, yes, foam is in a way a linear structure and it's been getting less and less uniform and more and more structured at least up to now what might happen in the very distant future we cannot say with any degree of confidence but we know that up to now let me give you the traditional argument that um that you need to uh undermine uh is that explains that and that says that while the overall universe is indeed increasing in entropy so that the second law is maintained um locally * **locally there is a "complexation" of structures or the opposite of entropy; packing packages, then clustering packages and the act of "joining" packages, which is called merging (nuclei and atoms), interactions, chem reactions, etc.** that because of the flow of energy like from the sun to the earth there can be structure plants people or whatever but that's drawing the sun's energy so it's a it's a it's a local

(04)- concentration * **better to say "bond conglomeration" that increases order and structure**
 * **yes, it is the opposite of entropy which seems to contradict the second law, but in reality it is**

not, which seemingly contradicts the second law but no it doesn't really because the energy that it's drawing from outside more than makes up for that that's the conventional way of looking at it but there is another way uh i a thing that i think is very important is what william thompson who then became lord kelvin said in 1852 he had a very significant paper which he titled on a universal tendency in nature to the dissipation of mechanical energy and this this is the sort of story now he said he had chosen the word dissipation because it did not mean that energy was being destroyed only the creator could do that what what he could have said was that energy is spreading now if energy is spreading that doesn't mean to say that structure is being destroyed the image i give right at the end of my book is if i have a bit of a blob of ink on a piece of white paper and i put my thumb down on that ink i just get a smudge but if instead i take a pain a pen i can take exactly the same amount of ink and draw a beautiful diagram if i'm a good artist and my conjecture my contention is that is what nature is doing it is spreading out energy and creating structure and you can see a beautiful example of this it's been raining a lot in this uh around here in the last few days i walk down to a stream where the water flows over a shallow water flows over a a ford and water drops fall from the tree into the water so there's energy concentrated in that drop of water as it falls into the water but when it does that beautiful circular wings rings spread out so that is your spreading of the energy which was all concentrated in the thing and it's created that beautiful picture and you have lots of drops coming down and all those circular waves pass through each other they don't destroy each other they pass through each other so actually you can sit there and watch it for hours and it's a very beautiful effect that is energy spreading that i think is the right way one should talk about the second law of thermodynamics when you haven't got a system imprisoned in a box that drop of water is not imprisoned it is eventually because of the banks of the stream but if this was a still ocean those waves could go on forever well they could go on forever um but there's some attenuation of over over time there's attenuation but not of necessarily of the ratios because bigger ones will meet smaller ones and when the bigger ones meet smaller ones there's always a difference you what you need is difference to talk about science so your characterization which is what i had your point three uh that the history of the universe is not one of increasing disorder but rather of the growth of structure whereas the conventional wisdom says that yes there is the growth of structure that's obvious you can't deny that uh but it is it is because of the differential in the universe and different segments of it but still there's an overall disorder so that that is a crucial point because everything that you uh projects speculation of course everything you project is dependent upon that fundamental point is that right can you just i i could you repeat the point you said i may not i may not repeat it the same way the second time no no that doesn't matter the the fundamental aspects of your big speculations your big idea is based on the fact that the increasing growth of structure is a fundamental part of the what i think you call the law of the universe absolutely yes big idea this big idea um that this that's the important thing whereas conventional wisdom says yes we see the growth of structure of course we do but that is because we are in in in um in local areas drawing on the uh the energy of of of the totality and therefore in other areas the entropy is is still increasing so the overall uh sum is is still towards disorder over over time but locally there is this growth of structure because of this differential so what i'm saying is and you you've explained that but that is the fundamental uh idea that undergirds your your totality yes i mean can i just say something a little bit about black holes because black i mean this was the famous discovery of **Stephen Hawking** that when black holes form a huge amount of of **matter** is concentrated in a very small region but that is actually changing the structure of the universe it's putting a lot of **matter** in a very small space **matter or mass ??** um we know we've seen this marvelously when two black holes merge it's just like a drop of water falling into the into the water the gravitational waves spread out it's just unbelievable

the information that is constantly streaming over the earth with with the details of what is going on right back to very close to the big bang

(05)- right they're milliseconds they're very things the more we go down in the energy that we receive uh or we still go on picking up details i mean these radio telescopes now are picking up energy densities that are unbelievably low but they're still picking up all this fabulous structure and and a picture of what the universe is like **i mean let's go to let's go to the big bang because you have a a definitely a new vision** of it this is your **Janus point** and which you say time flows in both directions * **I have a different idea, I have shown it many times in a different interpretation... briefly: on the planck scales 3 + 3D where space-time "boils", there "alternates the arrow of time" to the right and left. In the global macrospace where space 3 + 3D is already much expanded, there the arrow of time runs only in one direction... etc.** or two directions from that driven by the expansion of the universe or the growth of structures so so take me through that so first i should say there are **two possibilities (according to Julian Barbour, two options) a)** that what happened at the big bang **b)** or the janus point uh one is a) that the in the talking in the conventional way the size of the universe does not go to zero **(to singularity)** this is the situation that lagrange discovered in 1772 then there you just **have a situation where effectively there are two universes with opposite directions of time there is one point** * **it's not very clear "how", "how" Mr. Barbour thinks...** where in the conventional way the size **of the universe is its least at the smallest value (about that singularity)** and the distribution of matter is most uniform and in both directions * **in which directions? time with one arrow and the opposite arrow ?? ?** away from it the matter clumps the structure grows that's the picture if the universe does not go to zero size possibly much more exciting is when it does go to zero size and it may be even there that my Janus point * **?? there is little explained here** idea may be challenged this would depend on exactly how quantum gravity comes out in the end it may be that there is actually just one point once very special shape of the universe and and out of it all possible shapes emerge bit by bit as it were from a single point a single shape **which i call alpha now that's an idea** * **(to have an idea is few, it must be "connected" to existing physics, like my HDV, for example)** which actually developed as i was writing the book and might even undermine the title of the book but either way the problem of the ora i think either way whichever possibility turns out to be the better **one the there is a an explanation of the arrow of time** that mystery of why everything flows in in the same direction if the size is non-zero then there is these arrows pointing **in his upper opposite directions and the symmetry is respected*** **all solutions have the same symmetry, I also speculate that "our Universe" (which occurred by a "jump" change from the previous state to our "after big-bang" - crooked path = plasma) could be and it is on two quadrants: "world" and "antiworld" (antiworld = world behind the mirror) with opposite arrows of time, ie with "opposite - symmetrical expansion" of "crumpled time dimensions".** all the solutions have the same symmetry if the size goes to zero and this more uh radical idea is correct then the universe will have **a unique beginning** the **law of the universe** says it must start **in the most uniform state** * **in the simplest ??, but only in the sense and with respect to MASS !!!!! .** Chaotically boiling vacuum = plasma begins to "expand" and "collapse" systematically. It expands into "physical fields" (there are 5 of them if I include the Higgs field, which is perhaps true) and begins packing into "elements - packages of matter", which gradually bind to each other, etc., as we know it from that genesis construction of mass structures. http://www.hypothesis-of-universe.com/docs/eng/eng_009.pdf Hard to say "what is the most difficult condition"? space-time without matter and space-time with matter (?) that is absolutely possible and from then on uh **variety = complexity will continue to increase** will go on increasing **forever each successive shape will have a greater variety = complexity, genesis compounding of mass structures** [http://www.hypothesis-of-](http://www.hypothesis-of-universe.com/docs/eng/eng_009.pdf)

universe.com/docs/eng/eng_009.pdf ; http://www.hypothesis-of-universe.com/docs/eng/eng_009.pdf so i i can appreciate um the concept and i see obviously our side of the big bang where time flows in the direction we're familiar with i flows as i'll put in quotes um but what happens on the other side * that is, says Barbour: two sides of the point of Bang...; I called it-described as two quadrants (world and anti-world) of one Universe, which, however, "prevail" everywhere and still in every stop-time and stop-state of the Universe-**Universe after the Bang** the other side you say structure uh also is developed as time goes in the opposite direction how does that happen first of all anybody like you and me who can talk to each other they're going to be on one side or other of the Janus point * why a "point"? why can't it be a "wall-interface-gate"?, or even that "quadrant" as I have it in HDV for "antiworld" ?? why not, why "point"? and for them for each side time will seem to flow forward in exactly the same way i mean one just analogy i mean imagine that you and i went to the top of mount fuji in japan and we walked in opposite directions down that beautiful mountain as we go down we find the landscape and the vegetation changing progressively as it goes down and essentially it will change in exactly the same way for each of us so as we go down in our separate ways we can't talk to each other we can't shout over top of man fuji and we just find that the the world changes in exactly the same way for us so if by the chance we could then speak on the phone we would say we've had exactly the same oh qualitatively the same experience you know i love the the analogies that you use here and and in your book i mean they're very rich and they're very meaningful and and of course they do support your vision um but i i always have to wonder that there seems to be a vast gulf between these human related macroscopic uh analogies and and what we're talking about in terms of of the universe there's so many bizarre things from quantum mechanics to uh size and everything else but but the analogies are great and uh you know so i i like them a lot yeah well like what i will say is i think they are it's it amazes me i think they are actually almost the first time anybody has spoken like this * (um, because you haven't read HDV) i it it it to me it is an amazing fact that people have just not questioned that box in which thermodynamics was discovered so much came out of thermodynamics including after 50 years the discovery of quantum mechanics they they all it was critical that box the the theory all assumed that the atoms and the molecules bounced elastically off the wall of the box and that led to they they confirmed the existence of atoms and molecules their sizes and eventually they discovered quantum mechanics that is absolutely amazing and people were so amazed by that and it seemed (?)

(06)- absolutely inevitable that the second law must be absolutely true and nobody has questioned that i search every time i look at what people have written in books in scientific papers i have not seen one single person questioning this assumption that the system is in a box well this also relates to this uh enormous contradiction that that you talk about which says that the universe had to begin with with very high order very low entropy * small entropy means a high state of order and this corresponds to a highly dense homogeneous foam of 3 + 3D space-time..., which is probably the only "equation" in reality, all other equations are only on paper from physicists... , because the equation in the universe as a "stop-state in stop-time" does not exist, there is an alternation of symmetries with asymmetries in the universe and the total equation has probably never been anywhere (only on paper) um and then has been going through this progressive degradation uh through the inexorable effect of the second law of thermodynamics and yet all around us there's there's the the growth of structure * to an increase in complexity; that is, "quality times quantity is constant"; $\infty \cdot 0 = \text{const}$ and what some people have done **Roger Penrose** in particular and he's a friend of all of ours and we wish him uh great congratulations for his long uh uh awaited nobel so that's great um but he talks about and he he even comes up a number the the level of of order in in that he has

to have in the early universe is like 10 to the um 121st power which is 121 zeros 10^{121} the number doesn't have a name um it's so large uh but so he has to come up with that in order to play out the traditional structure * (it will certainly be related to the extremely high curvature of the 3 + 3 dimensions of space-time in that "symmetrical foam") and you don't need to do that is that right well i my position that i've put in the book very hesitantly uh well i hope respectfully because it's two very great scientists is that both **Richard Feynman** and **Roger Penrose** may have got to the right answer but with the wrong argument yeah you take it you take on the biggest and the best yeah yes well no i i i mean i think it's it's the it's absolutely cl there's this famous theorem that Puangaray **Poincaré** proved in in in the early 1890s called the recurrence theorem that basically if you have a system which is got to be in a box then it will always come back to the state that it was in once before arbitrarily closely and if you look carefully at the arguments that both Feynman and penrose do underlying that is the assumption that the universe is in a box it's it's it's quite clear in in fineman and it's also if you look carefully in penrose when he comes up with that estimate that fabulous number 10^{121} basically he's assuming uh it's a critical point in his his first book the empress new **mind that the universe recollapses it doesn't expand forever** and that's what enables him to come up with an estimate he assumes that all the matter in the observable universe collapses into a black hole he estimates the entropy of that black hole * **in my opinion no... The universe expands and collapses CONCURRENTLY... the expanded space-time will be "flat Euclidean 3 + 3D" in which the collapsed 3 + 3D localities will "float", these localities will be galaxies and stars, inside the localities atoms and DNA. I have not yet considered whether "our" Universe will one day return to the same state as it was before the Big Bang** using hawking's formula and that's what leads him to this absolutely colossal number but pretty well all the evidence at the moment most cosmologists now are convincing **that the universe will expand forever, = expand its curvatures 3 + 3D** strong evidence the universe will go on expanding forever so i think that strongly undermines penrose's argument nevertheless uh that the universe would start off with a very uniform special state * **would start with a new Big-gang = a jump change from the state of "flatness to huge curvature of dimensions"** that was always very likely going right back to this paper of lagrange in 1772 that that it would be uh there would be a uniform a most uniform state in the past so i think that the the conclusion is correct but the argument is wrong jeff i would not answer back but roger might get he's only 25 miles away he might get a bit annoyed with me **Julian this has been absolutely fascinating it's remarkable how you have developed these ideas since last we talked i'd really be interested as your book is published the janus point a new theory of time we want to support** * **Do you want to support the idea of Janus-point because you haven't read HDV. Time did not arise at the point of Janus, but the flow of time began at that point... because space-time expands (at some pace today, at another time) and we travel after that time, we cut the "different pace" time intervals that were not chosen by the masters of physics, only designed as "unit intervals"... The pace of global space-time expansion is different from the pace of human-Earth progress in space-time it and as you get feedback from it and you get reaction from the physics of physics and cosmology communities** come back and talk to us tell us what they say and we'll we'll see your responses so congratulations on the book look forward to next time thank you for watching if you like this video please like **and comment below you can support** * (unfortunately... I when I add a comment to you-tube lectures, my post is immediately deleted within half an hour... and I do not know why). closer to truth by subscribing

JN, 24.11.2021 (today my father has a birth anniversary 24.11.1912) ; comment translated 22.12.2021