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What are the Strings in String Theory?

Dr. Matt O'dowd

(black font google-translator, red font my opinions)

Thank you 23andme for supporting PBS Digital Studios. You may have heard the usual pop sci-fi description of string theory. There are these tiny vibrating strings, and that's where all the particles of force come from, including gravity throughout the universe. This raises more questions than it answers. Like why strings? What are they made of? (Here http://www.hypothesis-of-universe.com/docs/i/i_001.pdf the great scientist L. Motl made fun of this question I asked him in 2001.) And what is it? for nonsense of strange proportions? In physics, we would like to reduce our description of the mechanics of reality to the simplest possible form. We expect that the most basic machinery will have as few moving parts or free parameters as possible. Therefore, the standard model of particle physics is considered incomplete. His equations predict many things with astonishing accuracy. First, however, they require us to fine-tune many mathematical buttons and numbers, using physical measurements to correct 19 free parameters, such as the number of particles, and then there is gravity that does not fit the standard model so there is certainly a deeper set of teeth and wheels. A theory that brings all observable phenomena into the same mechanical framework would be a theory of everything, and string theory is a great hope for it. In the following episodes, we will explore the bloody details of string theory, but today it is 10 + 1 string theory. Where does this crazy idea come from? I mean, why do we "need" small vibrating strings? Versus literally any other little vibrant anything? What exactly are the strings (and wavy lines, balls of dimensions) of string theory as primary? (When the title scientist asks in this way, it's a legitimate question. When a layman asks in this way, it's stupid pataphysical nonsense, so in HDV it's phantasmagoria that destroys people's awareness of the right knowledge about the Universe - is it Mr. Prof.P.Kulhánek?)The idea began in the 1960s with an effort to understand the behavior of hadron collections of glucose-bound quarks of strong nuclear force, which includes protons and neutrons as well as mesons that are a combination of quark and antiquark. Peculiarities of interactions between pairs of mesons, as well as the odd relationship between their angular momentum and masses. She suggested that the quarks in the mesons are connected, ? you guessed it, by strings. In this case, the strings of the stretched tube are strong nuclear force. Vibrating elastic bands made of gluons. (It's still just an abstract vision, the same values as the abstract vision of my HDV that those quarks, gluons, etc. are made by "packing-balling" 3 + 3-dimensions of space-time.) A lot of work went into finding quantum te orie strong interactions based on string physics. Many theoretical mathematical works... This theory had some success, but got stuck a bit and was eventually replaced by quantum chromodynamics. She is excellent. One of the reasons why this powerful force version of string theory is stuck is that it predicted the existence of unexpected and undesirable vibrational regimes in the gluon field of these chains. math failed ?? What is the vibrational mode in a quantum field? It's a particle. That is a completely bold vision. If string physicists told her for the first time in the Czech Basin in front of P.Kulhánek, P.Brož and similar physicists, she would be labeled as phantasmagoric would-be theories from unrecognized geniuses who have an unlimited ability to generate nonsense ... or these words: fellow citizens. http://www.hypothesis-of-universe.com/docs/x/x_031.pdf ; http://www.hypothesis-of-universe.com/docs/y/y_004.pdf) And one of these modes appears as an intangible spin-2 particle. However, the only hypothetical intangible spin-2 particle is graviton, a putative quantum particle of the gravitational field. If the gravitational field is

made up of quantum particles, which could actually be I don't know. **Mass is a "property" of an elementary particle** . But if so, then the gravitational quantum (**loop quantum**) should bear a special resemblance to the type of particles produced by this small investigation of hadron chains, except that nothing like graviton should appear in such a chain. This realization came in the early 70's.

A **bold new design** of forgotten mesons has appeared. What if the mathematics of this theory could be used in the theory of quantum gravity? In fact, what if all the force-bearing particles result from oscillations in small chains? → **Legitimate visions that do not deserve insult and ridicule... As HDV deserves in the Czech Basin as a phantasmagoria of unrecognized geniuses, with whom we must deal with their silence.** All we needed was to cut the strings. **What to reduce? length ?, tube diameter?** Like **20 orders** of magnitude smaller reduction from proton size on Planck scale. **This is already unobservable and easily approaches the "boiling vacuum", which is the "foam of 3 + 3 dimensions" of the "Time" and "Length" phenomena.** → http://www.hypothesis-of-universe.com/docs/c/c_384.jpg . Roughly a measure of the difference between the Milky Way galaxy and your living room. Oh, and we needed to add **22 dimensions to** the known 4. **But such a result "breeds" mathematical constructions that "require" "something".** No biggie. This was the so-called bosonic string theory. **(In my HDV I need 3 length dimensions and 3 time dimensions for quarks. See http://www.hypothesis-of-universe.com/docs/ea/ea_006.pdf and for assemblies of all baryons I need 9 length dimensions and 10 time dimensions, see page 9 at http://www.hypothesis-of-universe.com/docs/ea/ea_006.pdf For all mesons, 5 length dimensions and 6 time dimensions are required, see http://www.hypothesis-of-universe.com/docs/ea/ea_013.pdf page 3.** If it worked, it would be a candidate for a great unified theory combining all known forces. But why stay with it? **If the twisting strings...** Here at this point, **string theory literally copies my vision of HDV, with the difference that the "stringers" twist the strings "out of nowhere", I twist the space-time dimensions into packets-geons...** they can explain bosons carrying force, why not fermions. that contain matter? **In my HDV, leptons need 2 length dimensions and 2 time dimensions.**

During the 70s and 80s, several proposals introduced the idea of supersymmetry and thus bring fermions and bosons **into the same theoretical framework.** → **24 particles of the Standard Model.**

The resulting superstring theory sought (**I also tried stát**) to become an all-encompassing mechanism explaining the basic functioning of our entire reality. Theory of everything. As an added bonus, this ambition has shaved many dimensions. After adding fermions, only ten were needed. **Probably 9 + 1, nine in length and one in time. I need 9 length and 10 time dimensions for everything.** Then, in 1995, Ed Witten combined many forms of superstring theory into a single framework of M. **I theory into the framework of HDV.** All for a low price adding only one more spatial dimension for the eleven-dimensional theory. **That is, they are 10 + 1, why ten?** Well, history lessons are enough. Let's talk. **So twisted strings** could explain the whole universe. **I twist the dimensions of space-time, they twist the strings "out of nowhere".**

The twisted dimensions of the quantities cp could explain the whole universe. Here is the slight difference between HDV and stringtheorie...; only in that the strings are **"out of nowhere"** and my wave packages are from the space-time dimensions. **So why the 20-year madness against me ?, against my HDV ??, why the hatred ???** I dare say that no hypothesis in the world has undergone such a mad persecution as I did with HDV, and yet NO renowned scientists have made any major counter-arguments at all to sink it and send it to the dump - only the insults, humiliation and unbelievable suffering I have suffered. He accumulated 40

years of hard work (Of course, not a salary for a salary in some Fermilab or CERN as received by ALL physicists in the world who work in physics). That's a damn requirement. To understand quantum chains, we must first look at ordinary chains that are colder than you think. The key is that the strings can carry waves, and if the string has ends or is tied in a loop, then the wave ends up overlapping itself. I have been interpreting this vision and idea for 20 years on the Internet that: all sorts of topological loops, meaning that if the "outer arrow of time" is still in the future, the particle "inside" the package can twist "in the opposite direction of the time arrow" for a small super-short period of time. Antiparticles do this opposite twist of the time dimension. (?) that "time inside" runs in the opposite direction, ie in them time seems to run with the opposite arrow of time. → It is necessary to think again. In this case, you get a standing wave. Roughly speaking, when these moving waves overlap, they can either fold or interfere with constructive or destructive interference. See virtual pairs of particles in a vacuum. Constructive interference occurs only if the wavelength of the wave fits neatly several times along the length of the chain. Then the phases of the overlapping wave coincide correctly and this wavelength / frequency of the wave increases. All other frequencies tend to die out. As a result, only certain frequencies are possible for a given string. Corresponding to certain energies. These resonant frequencies depend on the length of the chain. It is also the voltage that defines the wavelength and so the frequency is related to the wavelength. This leads, for example, to specific vibration frequencies on the guitar string. But this kind of behavior, where only specific modes of discrete energy are allowed, sounds very quantum. Chain theorists were not the first to notice, Niels Bohr came up with the first quantum model for electron orbits by considering them as a ring as standing waves around a hydrogen atom, but quantum chains are much more ambitious than boring electron orbits. Tuned correctly, these discrete vibration modes can be made to match the properties of known particles. All 24 particles of the Standard Model therefore have "their" shape of the package packing and this is related to the "properties" of the particles, ie the forces. Mass is a property, spin, charge, and all quantum numbers are properties of that topological-geometric design of particles. The particle mass is just based on the length of the chain (see here that the vision of strings theorie does not contradict the view of HDV.) And it is a voltage, the voltage is, after all, just energy per unit length. The length of the chain defines the weight. In my vision, mass defines the "shape" of the twisting of dimensions... and not only mass but also other properties of matter. But it also defines which complex vibration modes are possible and these modes again define the properties of particles, and spin, so this is a great promise of string theory. So, Mr. Kulhanek et al. : from the very beginning for the creation of HDV, I follow the same logic of thinking about the "parameters of -quant numbers" elem. particles, ie the same phantasmagoria as string theorists. I don't know math ... I don't know where the stringers have problems, but I know it wouldn't hurt to think about my vision that a "string" isn't out of "nothing" and then they manipulate that "fluid", but it's space-time dimensions that are the real real fact for the solution. This is where the New Physics will go. By defining a single parameter, the chain tension or equivalently the chain length scale of all possible particles should be automatically defined. TS only manipulates the length of the scale at the strings to solve the mass, energy, and other properties of the electroparticles to, that's pretty shallow; The wavy lines of dimensions are a breathtaking spectacle, don't you think? → <http://www.hypothesis-of-universe.com/index.php?nav=ea> Compare this parameter with the other 19 free parameters of the standard model. Here I will quote WIKIPEDIA: *Although experimental evidence confirms the assumptions of the standard model, many physicists consider this model to be insufficient because it contains a number of indeterminate parameters, a number of fundamental particles, and other more theoretical considerations as a hierarchical problem. There are several speculative theories outside the standard model that attempt to address these shortcomings.*

It certainly sounds closer to the basic theory. Well, let's recap, we have these one-dimensional Planck scale structures, which can be in loops in packages like HDV or extended, have vibrational modes that define the properties of the particles. Literally as if the author was copying from my HDV. By the way, these vibrations are standing waves. You are not some abstract inner wave, strings are real physical springs and waves are twisting in real space, the author describes HDV but what are physical springs? common answers include pure mass energy of basic irreducible existence. Topological irregularities in the structure of reality I marvel at ..or the most common answer. It's a nonsensical question. They are essential, so they are not made of anything, what? .. I stare (!) or in other words from a material known as closing and counting onia. Astonishment, I hear for the first time in 40 years that a physicist string theorist would abandon the "unwavering" vision that those strings are from Nothing. I read this for the first time in 40 years. And also: what are they? I don't understand "onia". Most string theorists are more interested in what strings don't do, what they're made of. ?? That amazes me. That I have not yet read new visions of "what are the strings of" if not from Nothing ..?! So, what are they doing? : They vibrate well, obviously they can hold energy. ((To vibrate, it must be supplied with energy, or vice versa: by vibrating, it produces energy? So who "vibrates?")) They can expand, they can also merge and separate from each other. Basic ball-wave packs can no longer be divided, only conglomerates. These latter properties are important because it gives a mechanism for the interaction of string theory particles and their decay into other particles. Does strings-theorie mean that the strings are torn to other particles? that is, that the "general string" is "all particles, which when we fragment, we get the" basic particles "Standard particle model ??? jóó... This picture of string connection and division is a huge power of theory. HDV has that "power of theory," too. It solves one of the main problems with gravity quantization. At the moment, I would omit quantum gravity from the interpretation and comments. It is a nonlinear problem. See at http://www.hypothesis-of-universe.com/docs/eng/eng_030.jpg You may remember from our episode on quantum gravity if you try to describe gravitational interactions on smaller scales, the energy needed to interact at that scale. produce black holes. There is no way to even think about the shape of the gravitational field on the Planck scale. There is a "linear world of interactions" in the microworld. Gravity prevails in the macroworld and it is the "curvature of dimensions čp" in a nonlinear form. It is necessary to think about this question → It does not create a hopeless theory of conflicting chains it corrects, because graviton is a loop, not a point particle, its interactions are blurred around this chain and easily avoid the explosion of mathematical infinities. You get below Planck's length. It all sounds great and by the way it doesn't work for any geometric structure other than a 1D string. It doesn't fit here, there is a difference of vision. TS manufactures all element. particles only from a string that is one-dimensional. HDV is produced by elem. particles from 3 + 3D and also from extra-dimensions. So vibrant guitar strings, yes. Drum skin, no. Unfortunately, it will not be so easy. I guess the difficulty is in the mathematical construction of the idea of a "one-dimensional string" that it must "immerse" (or multiply ??) into 10 + 1 dimensions... Yeah, the strings themselves are 1D, but we even want to produce the properties of known particles. They need to vibrate in more than just three dimensions of space. In fact, the theory only works in exactly nine spatial dimensions plus one for time. Plus one for M theory, to which we will return briefly without exactly this number of dimensions. You will not get gravitons or other intangible particles. Let's look at why this is embarrassing, to say the least, in future episodes of the theory. It is a theory that works in a universe that is clearly not our own with its poor three dimensions of the universe. HDV encourages the vision that "higher states of dimensions", ie the more curved reality of čp, "float" in less curved states of space-time. The basic raster, thread, grid of events is the 3 + 3 dimensional Euclidean space-time and in it other space-time "floats", ie other more crooked "states" of dimensions. That's the idea. (it's even similar to the ether that

was from "Nothing". If the ether were "from the dimensions of space-time", curved, that would be another alternative, and perhaps it would take over = the ether from the dimensions of $\check{c}p$ but curved. And it "floats" in the basic grid $3 + 3$.

But this kind of thing does not discourage string theorists. 50-60 years. They are not at the finish line. Why ?? Is there a way to add more spatial dimensions, where do string physicists add those extra dimensions, where? that's their problem. They destroy our basic space-time to some n-dimensional state. That's not good. Much more elegant is that the "more curved states of the dimensions" float "(are nested) into less curved space-time... which are still in harmony with our perceived 3D universe, and the point is that the stringers destroy the basic essence of the universe = $3 + 3$ space-time. $3 + 3D$ is a geometric $\check{c}p$ and... and extra-dimensions are a "mathematical superstructure" of pseudodimensions that are built into matter to get our heads around this. Imagine that we lived in a 2D universe. We know that... but take my variant IMAGINATION; why should I imagine a world in 2D when I can imagine another world, the world of "curved tangled dimensions into balls - and then they are matter. Why can't you "imagine" it too? We perceive only giant x and y directions. But what if the plane is not really flat? What if the direction from? It has a small width. This is the pac-man dimension. Go through the small width of this dimension and you will find yourself where you started. Very small objects, such as quantum strings, could explore the extra dimension and oscillate importantly in it. Certainly, flat 2D ants consider the third dimension to be the extra dimension. We $3 + 3D$ people imagine extra dimensions how? Me in HDV as I describe. And what about you ? But we giant lumber Flatlanders would have no idea it existed. Okay, now increase it by three large dimensions of space and six small dimensions of Pac-Man, which only strings experience. Well, you see abstractions, you go too. Voila string theory is stored Modern m-theory suggests (I also suggest, everyone suggests ..) Another large spatial dimension of our universe is 3d space and 1d time, is like a flatland on this 5d object called a 5-gate M-theory combining different versions of the theory strings, as it demonstrates some philosophically fascinating dualities between different ways of thinking about dimensions. *I understand... but you do not understand HDV, mainly because you did not read it, you refused to read it because it was invented by a nerd, a masquerade, which all Czech physicists think only because at the beginning (approx. 2004-2006) it was a couple of villains who had their unwashed mouth (+ huge hatred) and started slander, insults and a witch chase. Ultimately, it also leads to ultimate duality. This is the holographic principle of Patience, locusts. We'll get there. The exact behavior of the strings depends on the shape of their compact dimensions. In other words, in the words HDV: the behavior of mass elements from dimensions into precise shapes-shapes-geons-wave packages, ie the design shows the reality of the properties of particles-matter and the mutual behavior of matter-interaction. In fact, one free parameter in string theory becomes a configuration of other dimensions. These are just multi-colored verbal descriptions of the same reality in HDV and Theorie strings.. Find the right location in this chain landscape and describe the universe perfectly, the only problem is that there are an estimated 10 to the power of 500 possible options and almost no way to find out which one is ours. ? Now the string theory seems to be in a dead end. Why? about mathematical notation. Option b) → HDV This did not yield any confirmed predictions. Some would say that no predictions were feasible. Tuning the string landscape to fit our universe is daunting and perhaps impossible. I don't understand why the world neglects to read HDV when I send my visions from time to time to various physicists around the world of physics. That's many thousands of email letters in 20 years. (I have them in the archive). In the coming episodes, we will take a deeper look at the successes, failures and deep strangeness of string theory, 60 years of research ovky hundreds to thousands of scientists are working on it (in equipped laboratories and institutes with mutual consultation) and the result .. ?? ..

"something to zero" ... I have also been working on HDV for 40 years... result zero (ie only a few) but I am alone against everyone, against an extremely strongly hated gang in the Czech Basin. then you can decide for yourself whether to accept the basic string nature of space-time. Thanks to 23andme for supporting PBS Digital Studios and 23andme, a personal genetic society created to help (no one helped me though I begged) people to understand what their DNA says about them, October is a month of family history, which is a great time to explore and learn Learn more about your own family and ancestry discovery that can lead to new connections with others. Learn more at 23andme.com/spacetime. Last week we talked about the basic computational limits of our universe and, by the way, what would be needed to calculate the simulation of the universe on the horizon of black hole events. Let's see what you had to say Roman R asks if a calculation on the event horizon would experience a massive dilation of time in relation to an external observer So how do we see the results of the calculation? Yeah, that's a problem. Really? You can practically never read the results of the event horizon calculation. I will forgive more comments ..

In the video, I mentioned that you would subtract the result of Hawking radiation, which would take a long time before the last star in the universe died to give you only a small fraction of this reading. Slow reading with Hawking radiation is equivalent to the problem of time dilation. You know what these computers suck with a black hole. We will not build one. Several of you have pointed out that a computer with a black hole could not store information about other black holes, and you are right, this is one of the assumptions we made in the calculation. Our supermassive black hole computer is big enough to contain all the information in radiation and matter But most of the information in the universe is in black holes or more accurately Most entropy or hidden information is in black holes So our black hole computer can't contain information hidden in all black holes . It can't even contain information from black holes larger than herself. Yuval Nehemia has returned to an old video that quotes me calling Neil deGrasse Tyson. To simulate the universe, you need a computer the size of a universe. In direct contrast to everything I said recently about the binding of Bekenstein. It's hard to believe I ever said anything wrong before I'm afraid Yuval caught me. You can build a space simulator smaller than space. The space simulator you would build inside this universe has limits It could not simulate the universe so perfectly that the simulated universe could contain an equally good space simulator There is no infinite set of nested simulators As I said, our black hole computer is only a particle simulation, not black holes It's like the simple arrays of logic gates that people create inside Minecraft Emulators, they're never as effective as the original hardware, Sam Gil tells us that this was the most boring video I've ever seen. I have to say, I'm flattered a little. Have you been to YouTube? Even PBS Digital Studios has spectacular applicants. And what about one where Johansson does nothing but lick a lollipop for more than 17 minutes? Or Vanessa Hill's literal "boring video of all time"? This is actually quite interesting

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Matt O'Dowd Written by Matt O ' Dowd Graphics by Luke Maroldi Mike Petrow's Assistant for Editing and Sound Design Created by Kornhaber Brown (www.kornhaberbrown.com) In physics, we would like to reduce our description of the mechanics of reality to the simplest possible form. We expect that the most basic machinery will have as few moving parts as possible - or free parameters. Therefore, the standard model of particle physics is considered incomplete. His equations predict many things with astonishing accuracy, but first they require us to tune many mathematical knobs and dials. We need to use physical measurements to correct 19 free parameters, such as particle masses. And then there's gravity, which doesn't fit the standard model at all. Thus, there is certainly a deeper set of gears and wheels - a theory that brings all observable phenomena into the same mechanical framework. That would be a theory of everything, and this is the great hope of string theory.

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Translated by google translator ... maybe there will be those who have mercy and translate into English better
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