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# Does Kirk die when he goes through the transporter?

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Does Captain Kirk die when he goes through the transporter? This question has kept me up at night for decades. I'm not kidding. And I still don't have an answer. So this video isn't going to answer the question, but I will explain why it's more difficult than you may think. If you haven't thought about this before, maybe pause the video for a moment and try to make up your mind. Do you think Kirk dies when he goes through the transporter? Let me know if at the end of this video you've changed your mind. So how does the transporter work? The idea is that the person who enters a transporter is converted into an energy pattern that contains all the information. That energy can be sent or "beamed" at the speed of light. And once it's arrived at its final destination, it can be converted back-into-the-person. Now of course energy isn't something in and by itself. Energy, like momentum or velocity is a property of something. This means the beam has to be made of something. But that doesn't really matter for the purpose of transportation, it only matters that the beam can contain all the information about the person and it can be sent much faster and much easier than you could send the person in its material form. Current technology is far, far away from being able to read out all the information that's necessary to build up a human being from elementary particles.\* DNA - that's all the information, and when "soup of  $10^{35}$  elementary particles" is added to it... then the computer should be able to build a human from those  $10^{40}$  space-time dimensions .. that don't have to be "collected" all over space boiling vacuum "and the weight is delivered by itself when the "twists" of the dimensions. And even if we could do that, it'd take ridiculously long to send that information anywhere. According to a glorious paper by a group of students from the University of Leicester, assuming a bandwidth of about 30 Giga Hertz, just sending the information of a single cell would take more than  $10^{15}$  years, and that's not counting travel time. Just for comparison, the age of the universe is about  $10^{10}$  years. So, even if you increase the bandwidth by a quadrillion, it'd still take at least a year just to move a cell one meter to the left. Clearly we're not going to build a transporter isn't going to happen any time soon, but from the perspective of physics there's no reason why it should not be possible. I mean, what makes you you is not a particular collection of elementary particles. Elementary particles are identical to each other. What makes you you is the particular arrangement of those particles.\* Yes, it will make a person = he will make an act of wave wrapping of dimensions "according to information from DNA" So why not just send that information instead of all the particles? \* There is no need to "collect-collect" elementary particles of a human and send them somewhere, just "pack-pack" dimensions that are immediately unwrapped around us today (they are chaotically packed in a boiling vacuum - and this disorder is not human, man is an "ordered package curved dimensions" according to DNA) That should be possible. And according to the best theories that we currently have, that

information is entirely contained in the configuration of the particles at any one moment in time. \* Well, by the way, I'm not an expert at all. That's just how the laws of nature seem to work. !! Once we know the exact state of a system = DNA at one moment, say the position and velocity of an apple, then we can calculate on paper or construct in real life ?! what happens at any later time, say, where the apple will fall. I talked about this in more detail in my video about differential equations, so check this out for more. For the purposes of this video you just need to know that the idea that all the information about a person is contained in the exact configuration = DNA at one moment in time is correct. \* !! But je it is something else to "build" 14 billion years of DNA and something else to "replicate" configurations in DNA and it can... can take 9 months (!?!)... Cell division in the uterus controlled by DNA can be the "structure" that uses "dimensions of two quantities" + information... This is also true in quantum mechanics, though quantum mechanics brings in a subtlety that I will get to in a moment. So, what happens in the transporter = "cannon of a woman" is "just" that you get converted into a different medium, óóó, oh „medium“ ?? all cell and brain processes .. "the old finished person" are put on pause, and then you're reassembled back \* ""but by the act of wave-wrapping space-time, ie dimensions into configurations = man and all those processes continue exactly as before.\* as in the mother's body For you, no time has passed, ??? Kirk did not follow, he was made "by leaps and bounds" from information without time, but a replica of man in the real-universe must take place "in time" for 9 months in his mother's body, that is reality, Kirk is science sci-fi. you just find yourself elsewhere.\* ??? , and where ? on the other side of the Universe? At first sight it seems, Kirk doesn't die when he goes through the transporter, it's just a conversion.\* And that's real 100% science fiction. This does not happen in inanimate nature or in chemistry or plasma, anywhere. But. There's no reason why you have to convert the person into something else when you read out the information.\* It is possible to convert information by reading from DNA (which is a highly complex conglomerate of large-capacity curvatures of dimensions of two spatiotemporal quantities) into "something else". which is the germ of a new man in the womb, it is possible to transfer information from DNA to a new material "product" and možná and it may not be necessary to "copy" the information completely from the original - from DNA to create an identical copy (?) You can well imagine that you just read out the information, send it elsewhere, and then build a person out of that information.\* I will read but why send them ?? "Elsewhere"? where ? And then, after you've done that, you blast the original person into pieces.\* Why ? Why mow your mother? which "produces" according to the DNA of a new person, namely "accelerated reproduction by packing the dimensions of space-time", thus copying the bambiliards of packages and their conglomerates from those dimensions? Can one do the same for elementary particles? \* Why would I "chop" the original elementary particles? if I can make new ones by "quantum packaging of dimensions"?, according to laws, rules and according to DNA = a set of information!?!? I don't think so. I also.. But maybe you can do it for atoms, or at least for molecules, and that might be enough. But there's another reason you might not be able to read out the information of a person \* why ? the ability to read information is there, it is "reading DNA" until the creation of the universe - that's where DNA began...; people still don't know where DNA has its "beginning"! without annihilating them in that process,\* what process? Passing an 80 kg heavy human Kirk through a transformer ?? and thus "read information from 80 kg of flesh and bones" ?? which will be "extruded" by ?? namely that quantum mechanics says that this isn't possible.\* Of course, not exactly, that's why a child doesn't exactly look like a mother or a father... You just can't copy an arbitrary quantum state exactly. However, it's somewhat questionable whether this matters for people because quantum effects don't seem to be hugely relevant in the human body. \* And as the "chemical reaction" does, it still copies information = laws and "itself" implements → metal + acid = salt ;



But if you think that those quantum effects are relevant, then you simply cannot copy the information of a person without destroying the original.\* **And as the "chemical reaction" does, it still copies information = laws and "itself" implements → metal + acid = salt ;**



So in that case the Copy Argument doesn't work and we're back to Kirk lives. Let's call this the No-Copy Argument. However... there's another problem. The receiving side of the transporter is basically **a machine that builds humans out of information.** \* **We need to say better : "crooked dimensions of space-time" + information from DNA = people.** Now, if you don't have the information that makes up a particular person, it's incredibly unlikely you will correctly assemble them. But it's not impossible. Indeed, if such **machines are possible at all** \* **thus the machine is the uterus in the mother** and the universe is infinitely large, or if there are other universes, then somewhere there will be a machine that will coincidentally assemble you. \* **Why go to other universes ?? with the same dimensions and the same laws-information ??** Even though the information was never beamed there in the first place. Indeed, this would happen infinitely often. So you can ask what happens with Kirk in this case. He goes into the transporter, disappears.\* But **copies** of him appear elsewhere, coincidentally, \* **Mrs. Sabina's copy will not be the same as Sabina's, but it will be her child, according to DNA, little Sabinka** even though the information of the original was never read out. You can conclude from this that it doesn't really matter whether you actually read out the information in the first place. \* **On the contrary! You cannot make copies without information** The No-Copy argument fails and it looks again like that the Kirk which we care about dies. There are various ways people have tried to make sense of this conundrum. The most common one is abandoning our intuitive idea of what it means to be yourself.\* **? therefore "identical copy" ?? Only elementary particles (quarks, leptons, bosons) are complete copies of themselves, they are packages of twisted dimensions into an exact configuration, they are indivisible and if you break them in the collider "jets" will form = shards, which are not identical elementary particles..** We have this idea that our experience is continuous and if you go into the transporter (**to the crematorium**) there has to be an answer to what you experience next. Do you find yourself elsewhere? **In heaven...** Or is that the end of your story and someone else **soul** finds themselves elsewhere? It seems that there has to be a difference between these two cases. But if there is no observable difference, then this just means we're wrong in thinking that being yourself is **continuous** from the beginning. **And yet! ! quarks, leptons, bosons have been the same since the Big Bang to this day** The other way to deal with the problem is to take our experience seriously and conclude that there is something wrong with physics. That the **information about yourself** is not contained in any one particular moment.\* **Each stop-state of my person-person is a different configuration of elements.** Instead, what makes you you is the entire story of all moments, or at least some stretch of time. In that case, it would be clear that if you convert a person into some other physical medium and then reassemble it, that person's experience remains intact. \* **Crap. You can't fragment a person and then fold it again.** Whereas if you break that person's story in space-time apart, by blasting them away at one place and assembling a copy elsewhere, that would not result in a continuous experience. At least for me, this seems to make intuitively more sense. But this conflicts with the laws of nature that we currently have. And human intuition is not a good guide to understanding the fundamental laws of nature, quantum mechanics is exhibit A. Philosophers by the way are evenly divided between the possible answers to the question. In a survey, about a third voted for "death" another third for "survival" and yet another third for "other". What do you think? \* **The transformer machine is not a DNA + space-time artifact = a newborn = a little Sabinka.** And did this video change your mind? \* **No.** Let me

know in the comments. **O.K.** This video was sponsored by Brilliant which is a website and app that offers interactive courses on a large variety of topics in science and mathematics. I love their courses because they are so to the point, and they allow you to explore the depth of each topic on your own. It's a great place to learn something new, but also to freshen up knowledge about something you learned long ago. For more background on the physics behind transporters, check out Brilliant's courses on differential equations, classical mechanics, or quantum objects. All their courses will challenge you with questions so you can check your understanding along the way. To support this channel and learn more about Brilliant, go to [brilliant.org/Sabine](https://brilliant.org/Sabine) and sign up for free. The first 200 subscribers using this link will get 20 percent off the annual premium subscription.

**Warning: I do not speak English and therefore the dialogue via the "translator" may be slightly inaccurate**

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