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Can Physics Be Too Speculative? An Honest Opinion. Sabine Hossenfelder

Může být fyzika příliš spekulativní? Čestný názor.

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In March, 2021 I was contacted by an editor of Physics Magazine, that's an online journal of the APS, the American Physical Society. He asked if I'd be willing to write an opinion piece about whether some topics in physics are too speculative to be legitimate research. He also suggested some topics to consider, for example string theory and Avi Loeb's claim that the interstellar object 'Oumuamua was alien technology. I thought, I'm exactly the right person for this. And, you know me, I wrote an honest opinion piece. But when that was done, another editor popped up to say, I paraphrase, that was a little too honest and they wouldn't run it because it might offend some of their readers. And I said to myself, you know what, I think my subscribers on YouTube will appreciate some honesty. **O:K: Can physics be too speculative? That's what we'll talk about today. My opinion: neither speculative nor not, but it is selective for the authors' visions... some topics scientists are willing to comment on dialogue and argumentation, others are outrageous and phantasmagoric for them than to deal with their removal by proper scientific counter-arguments, they simply ignore visions with superior pride that Their vision cannot be surpassed... never by anything Imagination and creativity are the heart of science. But if you look at the headlines in the popular science media, you can't shake off the feeling that some physicists have gotten ahead of themselves.** There's multiverses, dark matter, string theory, fifth forces, and that asteroid which was supposedly alien technology. These ideas make headlines, but then you never hear of them again, like hundreds of hypothetical particles that were never detected and tests of string theory that were impossible in the first place. Or they later turn out to be wrong: all reports of fifth forces disappeared, **see the sages from the Silesian University in Opava and their fifth element** and that asteroid was probably a big chunk of nitrogen. ☺ I have talked about each of these topics previously, so today I want to look at the big picture, **a picture of the speculativeness of physics or rather of the speculativeness of some chosen conceited physicists...** Is all this speculation good for something, is it normal science, or is it in the way of progress? The question how much speculation is healthy differs from the question where to draw the line between science and pseudoscience. **And for that, world scientists are Czech scientists... from Opava (Stuchlík and team), Bludný balvan Dr. Grygar, or conceited speeches by masters like Pavel Brož, and all their seconds Hála's, Petráska's, Hacker's, and Hnědkovsky's** That's because **physicists usually justify their speculations as work in progress,** so if I have to understand it exactly, then science is everything that is not developed, it is agreed (probably by God) and wonder is everything that is developed, which are the reasons for whom, those pseudo-scientists? or the

real scientists who already have "everything done" and no longer have to deal with anything ?? Then it is quite interesting that those scientists who are not pseudo-scientists themselves constantly repeat how physics has a lot of problems, the least of which are often repeatedly "spelled out" five fundamental... so they don't have to live up to the standard we expect for fully developed scientific theories. It's then not as easy as pointing out that string theory is for all practical purposes untestable, no, it is not so easy to show that the strings are "twined from Nothing" and in order to be able to vibrate they need an environment of 11 spatial dimensions (in addition, they vibrate with God's motive, because only those vibrations are said to supply energy to the Universe) because its supporters will argue that maybe one day they'll figure out how to test it. ☺ yes, they have it hard... The same argument can be made and they use it, about hypothetical particles, axions, gravitons, "particles for black matter" .. not even the Higgs boson has ever been seen in the LHC, only "jets-products-shards" were observed and according to them THINKING of the higgs-boson... and behind Karlovy Vary is the volcano Komorní Hůrka and there are also "dowsers" they think that if they smoke from the ground, that there will probably be devils in the ground... The same argument can be made about the hypothetical particles that make up dark matter or those fifth forces. Ha-ha *Maybe one day they'll find a way to test them. So just looking at testability doesn't help. The question we're facing is more similar to the one that the philosopher Lakatos posed : **Which research programs make progress, and which have become degenerative?** When speculation stimulates progress it benefits science, but when speculation doesn't improve our descriptions of nature, it eats up time and resources, and gets in the way of progress. So, there is no one-size-fits all answer to the question what speculation is healthy. However, if speculation does not improve our description of nature, it will kill time and human resources and hinder progress. Yes. So there is no universal answer to the question of what speculation is healthy. Yes, but who is the arbiter of "what speculation is and what is not" ?? God ?? Are they speculations of such a vision, which no one has ever seen, read, researched or given strong counter-arguments to them ??? ...?...? *We have to make this assessment on a case-by-case basis. Sure. Who has already made an assessment of HDV, that it is a mistake of theory, is unacceptable, is it a phantasmagoria from a deranged layman ??? Sabina says: **we have to judge** ..so why 40 years avoids communicating the assessment of HDV ??? So look at some of these cases, starting with dark matter. Let's then look at some of those cases, starting with dark matter. The original idea of dark matter was a simple parameterization that fit a lot of observations, the observations were correct, but the way of evaluating those observations was flawed. Eg.

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it was a paradigmatic example of a good scientific hypothesis. However, dark matter has trouble with more recent observations, and physicists in this field have adapted to the data, I repeat: the data may be obtained by erroneously evaluating the correct observations... which means that the model adjusts after seeing the data, instead of making successful predictions. !! that means they modify the model after they've seen the data, rather than making successful predictions. Moreover, all those specific particle models for dark matter that physicists have put forward are unnecessary to explain existing observations. They're just adding superfluous details. These models produce publications but they do not further progress. That we're not making progress with inventing all those new particles is unsurprising because guessing a specific particle from unspecific observations of its gravitational pull has an infinitesimal chance of working. So, lots of speculation that doesn't lead to anything. Particle dark matter is clearly a degenerative research program.

The data are "clinked" by poor evaluation, eg the velocities of stars in the arms of galaxies obtained from redshifts were fitted to $\text{Newton } F = G \cdot M \cdot m / r^2$ and the state of velocities was evaluated so that they are so high that the arms of galaxies should have long since moved away from the center of the galaxy (it should no longer hold together) and thus that there is probably some invisible mass in the galaxy that arms holding together. - No, it's not like that, that r - is the distance in the arc between the stars, but physicists have inserted straight uncurved lines. There is already considerable curvature of space-time in the galaxy, so the " r " must be a line in the arc. Then there will be other results that say that there is no dark matter in the galaxy, nothing is missing.

Theories for the early universe or fifth forces for dark energy suffer from a similar problem. O.K. They do not explain any existing observations. Instead, they make the existing theories more complicated without solving any problem. Again, this isn't healthy speculation. It's a waste of time. . For the Opava physics gallery (Stuchlík et al.), However, it is a good source of income... to have these and similar speculations It's a strategy that has almost zero chance of working, and it does as a matter of fact not work. You don't actually need me to point this out, just think about all the wild ideas that you read about that never seem to pan out. This too is clearly a degenerative research program. O.K. String theory is a different case. That's because string theory is supposed to remove an inconsistency in the foundations of physics: *The missing quantization of gravity*. What is it? Is it the quantization of a smooth continuous dimension? If successful, that would be progress in and by itself, even if it doesn't result in testable predictions. Now, string theorists have pretty much given up on their original goal and never satisfactorily showed the theory solves the problem to begin with. You might find that disappointing, but that's how science goes. They worked on it for 40 years. There were thousands of them, they had laboratories and enough money. I wrote to them about HDV for 40 years to understand and help me. <http://www.hypothesis-of-universe.com/index.php?nav=e> They ignored my HDV and my toil. It doesn't always work out the way you wanted to. I perceive even more strongly the contempt and lack of perception of my HDV, which has basically never been studied let alone discussed and refuted, .. I perceive it in strong indignation that science was willing to deal with phantasmagorias such as the fifth force, dark matter, axions, multiversions, teleportation -

entangled abilities of particles, etc. and not to study the two-quantity Universe. Much of what goes as "string theory" today has indeed nothing to do with the original idea of a theory of everything. Instead, string theorists apply certain limits of their theory **in an attempt to describe condensed matter systems.** However, mathematics can "process" any bullshit such as "strings from Nothing" and then vibrate with them into 11 dimensions of the "environment", which it unpacked for this purpose ... why did they not process the same "bullshit" as "wrapping" - the twisting of the dimensions of the space-time dimensions themselves? The meaning is the same = to make elementary particles. They made "from Nothing", I made the dimensions by packing them into geons. Why they didn't understand HDV is a mystery to me. Now, in my opinion, (SH) string theorists vastly overstate the success of this method. But the research program is progressing and working towards empirical predictions. I'd say it's overhyped, but it isn't degenerative. What's with the multiverse? Multiverse "research" begins with postulating the existence of entities that are unobservable, in principle. This isn't just degenerative science, it's unscientific. **Agreement.** The origin of the problem seems to be that many physicists are Platonists – they believe **that their math is real, rather than just a description of reality.** * Yes, this is a perfect observation - I come across it very often, there are a lot of "super-scientists" that elevate the mathematical expression of reality over physical reality, and literally and literally. → http://www.hypothesis-of-universe.com/docs/aa/aa_054.pdf **What is not described in mathematics is physically wrong, they are even delusions and intrigue.** But Platonism is a philosophy and shouldn't be mistaken for science. So, multiverse research has a problem, but it's a different problem. What about Avi Loeb's claim that the interstellar object 'Oumuamua was alien technology? Loeb has justified his speculation by pointing towards scientists who talk about multiverses and extra dimensions. **Here I am against the invocation of aliens and multiverses, but on the contrary I am in favor of special dimensions if they are perceived and understood as coiled dimensions of two quantities "Length" (space-has 3 dimensions) and "Time" (time-has 3 dimensions), ie 3 + 3D into geons-packages-cocoons-balls which we will call-call them elementary particles of matter. And not only to say, but - I hope - we will try / even try to verify that this is really the case in the reality of the universe: matter is thus realized by the Universe itself.** He seems to think his argument is similar. No, multiversum is not a problem "similar" to some aliens. I don't even believe in aliens, I have a different opinion: we are alone in the whole universe. → http://www.hypothesis-of-universe.com/docs/aa/aa_037.pdf ; http://www.hypothesis-of-universe.com/docs/eng/eng_009.pdf ; http://www.hypothesis-of-universe.com/docs/g/g_041.pdf . This, by the way, is an excellent illustration that most physicists never even think about the question what research projects are promising and why. !! Because if he'd ever actually thought about it, he'd known better than to make this comparison. Loeb's argument about aliens isn't degenerative science and it isn't unscientific either. **It's just bad science.** He jumped to conclusions that simply aren't supported by the data. It isn't hard to guess that many physicists would object to my assessments. And that's fine. **My intention is not so much** to argue this particular assessment is correct, but that such an assessment must be done regularly, in collaboration between physicists and philosophers. **Yes, I am not even saying that my HDV already holds that the Universe is like that... but I am arguing that this proposal cannot be circumvented, ignored, neglected or expressed in arguments that are honest, scientific and decent. And that has happened for 40 years..** So, that was in my opinion piece for the American Physical Society. I actually think I was being very polite. But the second editor finally decided that when they asked for an opinion, the did not want to hear an opinion critical of the community. **To say the obvious, ignoring criticism is exactly how groupthink happens.** You have not yet penetrated the Czech community of physical intellectuals - it is a real horror there. They fail decent criticism and

decent dialogue. And this episode is a demonstration of just how it happens in physics. The point of my piece was to say, scientists need to regularly assess whether their research methodology is progressive. **!!!** The APS decided to not even ask physicists to think about what they're doing. For the spoken text in this video I slightly modified the text I'd written for the opinion piece, you find the original text in the info below. Would that have been too much for physicists to stomach? Let me know in the comments. **?? I've already written to Sabina 3 times this year ..., no reaction, not a word.** This video was sponsored by my friend and colleague **Brian Keating**, who has his own YouTube channel, called "Into the Impossible". Brian is also a physicist, more specifically, a cosmologist. **On his channel he talks about new experiments and theories.** **He's not talking about HDV there yet - probably because it's not "new", she's bearded, she's 40 years old!** Brian's interviewed Nobel Prize winners, billionaires, and an astronaut live from the Space Station. You might for example like his interview with Eric Weinstein and Michael Shermer or his video "Faith of the Physicist" about the Multiverse as a form of religion. His channel is both interesting and entertaining and I can really recommend you check it out. Last but not least, special thanks to our tier four supporters on Patreon. Your support makes it so much easier for us to keep this channel up. And you too can support us on Patreon, link's in the info below. And you can now also support us right here on YouTube, by clicking on the join button underneath this video.

So have a nice time, everyone. (You may even notice my hypotheses in the next 40 years) Out of desperation (that my candle is already burning) and that I don't have money for a consultant and translator, I translate my texts into English myself using google

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