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A conversation about the origin of the universe

The following is the transcript of a possible conversation that Dr. Manfred Pohl, emeritus physicist from a university who should not be named (named MP in the transcript), with a fictitious Prof. Dr. Karmin Unikos from the Institute for World Creation at the Extra-Terrestrial University in Exstern, Utopia (called KU in the transcript). Taking into account the current crisis in theoretical physics and the opinions of very many scientists who are concerned about this crisis, it can be considered a realistic assumption that such a conversation could have taken place in this or a similar way.

Professor Unikos is a representative of the opinion that the universe emerged from nothing, a model of cosmology that is called *mainstream* in technical terms. It is the standard model of cosmology that is still considered valid today. In the fictional conversation, Unikos stands for the typical representative of the standard model. As early as the middle of the 20th century, doubts arose about this model, together with its emergence, to which clear answers are available today, but the representatives of the mainstream do not want to recognize them.

Dr. Pohl takes the view that the universe did not come into being, it exists eternal, which emerges from the conservation laws. He therefore hopes to gain conclusive insights into why the mainstream representatives think this way and what they can say about the doubts about their model.

MP: Professor, you are of the opinion the universe once did not exist, but it had a history of origin that is the task of modern cosmology to be researched.

KU: *You say it. We know that the universe was formed with a Big Bang 13.8 billion years ago. These are the results of calculations that we have carried out on the basis of the established expansion of the universe.*

MP: Let's postpone the expansion for a while and turn to another question first. What is particularly interesting is what it came from. What was originally there that allowed the creation of the universe?

KU: *Nothing. There was a point of infinite energy density, the Big Bang Singularity, which began to expand and gave birth to all of the matter in the universe.*

MP: How do you have to imagine that? At first there was nothing, then there was a big bang and suddenly all of the matter in the universe was created?

KU: *You can't imagine it, it just happened that way. There is no alternative to this. There must have been a beginning. And if something had already been there, one could not speak of a beginning, but only of a continuation of the existing.*

MP: Aha. But now we know the law of conservation of energy, which says that energy cannot arise from nothing and also cannot disappear into nothing. This natural law, Professor, has been reliably proven. Of course, every now and then there are those who doubt this law who then intend to invent a perpetual motion machine. But there has never been a success in the long history of physics. The natural law is not disputed among physicists. So we can basically assume that it is correct. But that means that in the singularity of which you speak, all the energy present in the universe must have been concentrated.

KU: *Well, Mr. Pohl, the law of conservation of energy didn't even exist yet. It only has been established with the Big Bang.*

MP: So you mean there are laws of nature that only apply sometimes? That forces us to answer the question of when they are valid and when they are not.

KU: *No, no. It's not like that. After they are created, they always are valid.*

MP: That means that after the universe was created, the law of conservation of energy is now always valid, according to which energy cannot arise and cannot disappear. But that means, if it is always true, the energy has to exist forever, doesn't it?

KU: *It is exactly the same, the law of conservation of energy has been clearly proven. There is no doubt about that.*

MP: Well, I'll ask about that again later. But first something else. The mass-energy equivalence $E = m \cdot c^2$ theoretically derived by Albert Einstein in 1905, according to which the ratio of energy to mass is constant: $E/m = c^2$, has also been clearly proven by many experiments. So there is no mass without energy and vice versa. But that means that even the mass cannot arise or disappear, it must exist forever. To come back to the “point of infinite energy density”, the singularity: It would also contain an infinite mass density. Correct?

KU: *That's right. After the universe was created, mass and energy are conserved quantities. This is general basic knowledge that cannot be doubted.*

MP: I want to summarize what I have said so far. So you can tell that after the universe was created, it has been proven to exist forever. Isn't that a logical dilemma? If it exists forever, it can't have come into being, can it? So is the assumption of a Big Bang that created the universe a mistake? So there couldn't have been a Big Bang? Can you show a way out of this dilemma?

KU: *Yeah. We have clearly to separate two things here. Before the Big Bang, the situation was a completely different state. There was still no time and space in which such processes could be described, all this only came about with the Big Bang.*

MP: I don't understand. If space and time only came into being with the Big Bang, there cannot have been a “before the Big Bang” because “before the Big Bang” is a time about cannot be spoken of. The time didn't exist. So there cannot have been any “state” either, because there was nothing. For me this is logically impossible to grasp. On the other hand bothers me the question of how a space can come about, or even a time. Can you "to manufacture" a cubic meter or "to produce" a second? Space and time are not objects that can arise. How do you see it?

KU: *We have to think differently here. You see, we only knew the universe after it was 10^{-43} s old, that is, after the Planck period. We do not know what happened in the first 10^{-43} s, no one has yet been able to calculate it. We just have to take note of that. At the latest after this time there will have been space and time, because the expansion of the universe began.*

MP: That means that in the Planck time, the first 10^{-43} s, space and time must have arisen. But then time came into being in an already existing time that already existed for the creation of time. Is that a contradiction or just a different type of time? A “time of origin” and a “time after”, so to speak? And the whole space was also created during the Planck period? But it was still so small then, a point, as you say. Then how did he become infinitely great?

KU: *Well, when the space was created, it was very small. That makes sense. Then it expanded. That happened in the inflation phase right after the Big Bang. The time simply started with the Big Bang.*

MP: But the space is infinite in all directions. It must have expanded with infinite speed. On the other hand, how can space expand? That would mean he had to move. But it cannot move because it is not an object, a body, or a corpus. As I see it, only a material object can move. For example, mass, or energy that spreads. So in summary, only matter moves. She moves in space. The space itself does not move. But that doesn't mean it's standing still. The concept of movement cannot be used for space, just as the word sound cannot be applied to a meter.

KU: *That's not really explained, Mr. Pohl. The space does not move alone, but together with the matter that is in it. Both together expanded at a multiple of the speed of light during the inflation phase.*

MP: That doesn't make sense to me. After all, we know that matter cannot move faster than the speed of light in vacuum *c*. That is a statement of the mass-energy equivalence. And *c* is a natural constant, this is also known. Qualitatively, this statement is already understood from the fact that a finite mass cannot have infinite energy. Do you have any different findings? The space itself cannot expand because it cannot be assigned any movement. So the inflation phase is a mistake, isn't it? Because matter in space cannot move faster than c.

KU: *She doesn't either. Matter can only move in space with the speed of light, that is correct, but that does not apply to the space itself. Your assertion is incorrect. The space can expand independently of the matter, in doing so it takes the matter with it, so to speak.*

MP: At a multiple of the speed of light?

KU: *Yes, it is.*

MP: Then I'm right: The space is not a material object, otherwise it could only move with *c*. But how does it move then? If it is not an object, it cannot be assigned any movement. It's still unclear. In addition, if, as you say, matter is “located” in space, i.e. if it is “contained” or “accommodated” there, shouldn't it then also be possible to take it out of space? If so, it would have far-reaching consequences. Then we would have a space without matter on the one hand, like a container, i.e. an object that we have freed from matter, and on the other hand, matter without the space, because we have taken it out of the space. This is all very contradictory in itself. I think it can't be like that. Isn't it more the case that space is a condition for matter that cannot be separated from it? As I see it, space and matter cannot be two different, independent things. As we have already seen, space is not a “thing” at all, not an subject-matter, not an object. Matter can only be regarded as “spatial” because material objects can have an extension and several objects can have distances from one another. Without space there is therefore no matter. And without matter the term space has no sense, no physical content, because only material objects can have dimensions and distances.

KU: *You say that space is not a thing, not an object. But it really does exist. How must one imagine it if it is not a thing, but actually is there?*

MP: That is exactly the problem, Professor. Space does not “exist”, it is not “available”. Space is nothing, nothing at all. Space is the criterion with which we can explain the dimensions and distances of the objects. This is exactly what we do

with the help of spatial coordinates; there are always three; that we use over the objects in space in order to be able to quantitatively name their dimensions and distances. Coordinates are not a substantial part of the space. Space is immaterial. But non-material entities have no dimensions or distances. Otherwise one should be able to ask “what length is a force?” Or “how high is a second?” Or “how wide is the color red?” Or “how many tones does a meter contain?” These are all questions without meaning, why there are no answers to them.

KU: *You say that space cannot be without matter. Suppose it were so. Then we have another problem. Then how do you understand the term time? Do it also exist only together with matter? After all, in physics we speak about the space-time.*

MP: Yes, you got it right. Time only exists together with matter. Time is also not an object that can “exist” without matter. Time is also a condition for the existence of matter. Matter is in motion. Movement takes a duration. Duration is the measure of movement. Time is a one-dimensional coordinate for a duration. It was introduced as a unit of measurement for a duration so that a duration can be described quantitatively. There is no matter without movement. There is also no chronological sequence without matter, because only matter can be in motion. Without matter, the term time has no meaning, no content. Nor can we see the term space-time as an object that exists without matter. With space-time we can describe a so-called world point, that is the point in space of a material object at a point in time in its course of movement. So a world point has four dimensions. Space-time is therefore only the summary of the conditions for the existence of matter under a common term. Do you see it differently in principle?

KU: *I do think that we have to see it differently. Time flies even if there is no matter. If it were not so, we would not be able to determine when the matter was created.*

MP: But you said that time came into being with the big bang together with matter. And now it should already flow if the matter is not yet there? With that I still have trouble understanding it. But let's leave that now. I will now come back a second time to the Big Bang singularity, to the point of infinite energy density, that is, of which we had established that it must also be a point of infinite mass density. But now we also know that every mass exerts a force on every other mass, the gravitation. It is proportional to the masses and inversely proportional to the square of their distance. In the singularity this distance is zero. The mass is infinite, so it can be broken down into an infinite number of infinitely large mass elements. That is, the inner gravitation in the singularity is infinitely great. It is trivially recognizable: the expansion of such a point is impossible.

KU: *I consider it quite possible that gravitation did not yet exist in the singularity. It may even have to be so, otherwise the expansion would indeed not have started.*

MP: That would be another law of nature that only applies sometimes. Do you think that is logically understandable?

KU: *Well, I already said that the laws of nature only came into being with the Big Bang. Therefore, I think that gravity was not yet present in the singularity. But we cannot know for sure, because it cannot be proven by observations. Maybe it didn't yet exist. It would be the logical consequence if we assume that otherwise it would have prevented the expansion. Your thoughts on this are interesting. But the fact is that it has actually started to expand.*

MP: No, Professor. This is not a fact, because I am convinced that there was no such point. It cannot have existed, otherwise it would still be there. It couldn't have expanded. I assume where there is mass, there is also gravity. It is not plausible that this should have been any different. It raises the question of how the laws of nature “arise”. I consider such a question to be blasphemy. I am therefore sure that the universe did not “begin”, it has no “beginning”, matter did not arise, because it exists eternal, we already had a consensus on that. Your question now directs our conversation to the expansion of the universe. Had there been such a point, the universe would have to expand. That would be the logical consequence. If a material point or another material object is to begin to expand from a position of rest, there must be a force that triggers this expansion. What kind of force is it, where does it come from and where is its cause?

KU: *That's three questions. Let's start with the last one. We know that nuclear fusion processes are triggered under great pressure and high temperatures. For example, under these conditions, hydrogen fuses to form helium, releasing large amounts of energy. They lead to a detonation, it means an expansion.*

MP: Professor, I have to interrupt you here. There were no elements at all, so no hydrogen and no more complex elements. You said it yet: there was nothing.

KU: *You could possibly be right, but at the infinite temperature in the singularity, other thermal processes can take place that drive the matter apart.*

MP: But matter didn't exist at all, it was first, as you say, created, it came into being. It is unclear. The question arises as to why this happened 13.8 billion years ago and not at any other point in time.

KU: *The point in time is calculated by calculating back the actually measured expansion of cosmic matter. The motion is extrapolated up to this point.*

MP: Does that make sense? If we observe a yeast cake rising in an oven, do we work back to when it was united in one point? We can't even know whether it ever was, experience teaches us that it was not united in one point. Just like in this example, we cannot know whether a regionally determined expansion applies everywhere in the universe, it is infinite, and we can also not know whether it has always happened. We observe the cosmos for a few thousand years; measured against the billions of years in which cosmic processes take place that is far too little to be able to generalize. In my opinion, the above-mentioned extrapolation is a lack of meaningful numbers game that is based on completely nonsensical initial conditions, so that it most likely never existed in nature.

There is also a flaw in the calculation that you are probably familiar with: the expansion that is suspected was derived from the redshift of the cosmic rays of distant objects, which Edwin Hubble discovered in 1929. This has been interpreted as a Doppler effect from the movement away from us of the objects. That is certainly not true, because the law of absorption, which emerges from the Lambert-Beer law of radiation, has not been taken into account for the calculations of the radiation when crossing the cosmic distances. But you can't do that because every radiation is subject to the law of absorption as it propagates. This is also a law of nature that does not only apply sometimes. The energy loss of the radiation, which is shown by the redshift, has completely different causes. It can hardly or not at all be explained by the movement of the objects.

KU: *How can you be so sure that there is no Doppler effect from the movement of the objects?*

MP: Of course there is, but it doesn't matter here. There are mutliple reasons for this. One of them is the omission of the calculation with the absorption law, which results in a completely distorted picture. Another is the explanation that expansion is actually accelerating. But there is no energetic basis for this and no recognizable triggering force in the cosmos. A third reason is the observation results that have been obtained from many galaxies, the movement of which cannot be explained with the Big Bang model. Halton Arp has documented 338 such galaxies in his "Atlas of peculiar galaxies".

KU: *As for the accelerated expansion, do you deny that fact? After all, we know that the energy necessary for this is contained in the dark energy.*

MP: I can't see that we know. So far, no dark energy has been found or proven in any way. You won't be able to find it either because it doesn't exist. Just remember how physicists came up with dark energy. It was simply postulated without proof in order to maintain the accelerated expansion that they does not want to give up. They say it has to exist <u>because</u> the universe is expanding at an accelerated rate. With such a definition that is untenable for my understanding, they tries to compensate for <u>one</u> error with a <u>second</u>. But it would be much more natural to check the accelerated expansion for its correctness instead of stylizing it as an axiom and trying it to maintain with a speculatively declared form of energy that does not even exist.

KU: *So you mean that the accelerated expansion of the universe discovered by Edwin Hubble in 1929 doesn't even exist?*

MP: Indeed, it doesn't exist. We had just put together a few reasons for this. Nor it is true at all to say that Edwin Hubble discovered the accelerated expansion of the universe. As I have already explained, he discovered the redshift, and he found out that its size is proportional to the distance of the measured objects, which is completely logical because of the law of absorption. His initial approach, that it can only be explained as a Doppler effect from the movement of objects, he rejected as early as 1930 and favored “other causes”. To our regret, however, this is not being noticed today. It is simply kept secret.

KU: *If I were to mentally agree with your views for a while, I would no longer be able to recognize at all how the cosmic matter moves. Without the dark energy there would be no force that counteracts the gravitation of all objects. Sooner or later the whole universe would have to contract through gravity and collapse into a large black hole. However, it has been proven that this is not visible, and there are no observations whatsoever that would confirm such a process. Where do you see the forces that could prevent that?*

MP: First of all, I look a little piqued at your formulation "the whole universe". There is no such thing because it is infinite in all directions. What could that be, a "whole" infinity? Something whole is always finite. But only by the way.

I want to introduce the explanation for your presentation with a counter question. Is there an object in the universe that is not rotating? I am not aware that such a thing has ever been found. Rather, it is clear to me that there can be no such object. The rotation extends to stars, star systems, galaxies and larger object groups. Rotation is the all-encompassing form of motion of the cosmic matter. For example, would there be a solar system without rotation? With very basic considerations, you can find that it is not possible. But where does the rotation come from? Look, two objects are being accelerated towards each other by gravity. The result of this movement is added to your already existing movement

vectors. Both objects can therefore to clash or move past each other. The second case is by far the most common, which results from the proportions between the dimensions of the cosmic objects and their distances. The latter are always many times larger. Through these movements they will change their orbits, either circle each other elliptically or move away from each other in an "open" ellipse, a parabola. The constant repetition of these movements creates a general rotation in all large and small scales of the universe. Rotation is the general, all-encompassing form of movement in the universe. As a result, however, there are centrifugal forces everywhere, and consequently Coriolis forces as well. Everywhere in the universe there is a general centrifugation opposite to gravity, which forms a dynamic equilibrium with universal gravity. Gravitation and centrifugation are the two main forces that initiate and maintain the eternal chaotic movement of the cosmic matter. This does not require any speculatively devised dark energy, which would even have to make up the majority of all energy necessary for the functioning of the big bang model.

KU: *That is a very interesting approach, but one that completely contradicts the current standard perceptions. This would result in a completely different picture of the cosmos than we currently represent. Do you think we have to go that way?*

MP: I think we really have to do that, because the current cosmological model founded by the Belgian Jesuit Father George Edouard Lemaitre on the basis of a Big Bang singularity that began to dominate physics in the 1960s has, as we can see, a large number of errors and inexplicabilities, because of which its correctness must be doubted. At that time I myself witnessed this process of the occupation of the cosmology by this model and was amazed how so many physicists got involved in it within a short time. Lemaitre spoke of a primordial atom which, through constant splitting, produced all of the matter in the universe. I think you don't to have studied physics in order to see that this is a strange hypothesis. Today we can say with great certainty that the model has been refuted. The axiomatic adherence to this model is as incomprehensible as the rigid adherence to the geocentric view of the world after the work of Nicolaus Copernicus and Galileo Galilei. The recognition of the heliocentric worldview developed by both took place only after about 400 years, after it had already been part of common folk knowledge that the earth just not is the center of the world. This view had already become implausible worldwide, it could no longer be upheld. Will this process be the same with today's standard model of cosmology? Do the physicists want to wait until the peoples ridicule it? We can only hope that it won't take that long again.

Theoretical physics needs different approaches, which have to start with the elementary fundamentals. Probably the most decisive cause of the current crisis in physics is certainly the largely unclear concept of matter today, which has been progressively dismantled in the last few decades so that it is no longer based on the dialectical-materialistic basic conception. Some physicists even ignore it entirely. But how is physics, which is a natural science for the study of matter, supposed to advance without a clear definition of the subject of its research? A clear and unambiguous concept of matter, which is able to distinguish exactly material and immaterial entities, is indispensable the basis of any scientific activity.

KU: *There are definitely some details in your presentation that are worth considering. Certainly there are also individual shortcomings in the standard model. But that does not mean that it will have to be discarded altogether. We know these*

shortcomings and work is also being done to improve the model. Overall, however, it currently describes the universe best of all approaches.

MP: I see it differently. This "best" called description of the universe is more of a self-adulation of its advocates. The big bang model doesn't describe anything. It contains an enormous number of contradictions that are contrary to practice, which cannot be resolved and which mislead an entire branch of physics because the basic conception is wrong. To be able to sustain it, absurd speculations are required, which are far from a scientific method. They begin with the questionable thesis that matter emerged out of nothing, and continue with the emergence of conditions such as space and time, for which the term “emergence" is not definable and completely meaningless, and even natural laws cannot apply, without them having to arise first. You can't take any of this seriously. I want to quote a short section from the Open Letter, which was addressed to the scientific community by 33 eminent scientists around the world and published in the journal New Scientist (May 22-28 issue, 2004, page 20). Quote:

“The big bang today relies on a growing number of hypothetical entities, things that we have never observed -- inflation, dark matter and dark energy are the most prominent examples. Without them, there would be a fatal contradiction between the observations made by astronomers and the predictions of the big bang theory. In no other field of physics would this continual recourse to new hypothetical objects be accepted as a way of bridging the gap between theory and observation. It would, at the least, RAISE SERIOUS QUESTIONS ABOUT THE VALIDITY OF THE UNDERLYING THEORY. But the big bang theory can't survive without these fudge factors."

Quote end. The standard model does not have “individual defects”, as you put it, rather it is essentially wrong and is maintained by administrative means and with sometimes bizarre hypotheses, contrary to all common sense. And, as I said earlier, I don't understand that. Furthermore, it is incomprehensible that, despite its exposure as heresy and the increasing number of scientists with useful views, no change has been brought about and none seems to be in sight.

KU: *Those are harsh words with which you argue. Many of your statements are targeted directly against the basic views generally recognized today. Aren't you afraid of being considered a dissident by opposing science?*

MP: I am not at all in oppose of the science. In Richard Feynman's time you could still say, like him, that science is the culture of doubt. Today, however, in cosmology, doubts about the so-called official representations and opinions that differ from them are not tolerated; they are permanently suppressed. “…young scientists learn to remain silent if they have something negative to say about the standard big bang model. Those who doubt the big bang fear that saying so will cost them their funding…” the open letter elaborates. I am opposed to this, but not to science.

KU: *But that is difficult to understand if you want to question an entire branch of science in its basic features and throw overboard all the results that have been achieved so far. So I cannot avoid asking what you want to achieve with it.*

MP: I think, first of all, it would be important to give up ignorance of the many observational results that speak against the big bang theory and of the objections of numerous recognized scientists around the world. None of this is currently being considered in any way, more than that, it is hushed up, critics are defamed as conspirators, their views are held down without counter-arguments, and there is

no public exchange of ideas. We must finally put the theory to the test and allow the public discussion of other models, especially those that are free from the contradictions shown. This of course also includes the provision of research funds, the current refusal of which is denounced in the open letter I mentioned.

Any scientist who approaches the problem with genuine scientific interest will find that we cannot go on like this, or, if we put it very loosely, the cart is so stuck in the sand that it can no more be pulled out. And to stay in the picture: we have to abandon it and its load and build a new one.

Professor, thank you for the interview, with which I had the opportunity to express myself publicly on the problems, an opportunity that has so far been denied to me in science journalism because all journals reject to publish critical articles of the system by so-called reviewers.