

On the probability of origin of the universe and other matters.

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In this article I will be using some ideas from my theory, " On the consequences of a probabilistic space-time continuum" which I will call PSTC and which is available on vixra.org.

From Einstein we have the equation $E=MC^2$. We can look at this equation in a couple of ways. The first is that, any real mass M_R , also represents a "virtual energy" E_V that can be converted into real energy $E_R (= M_R C^2)$. The amount of "virtual energy" is also equal to $M_R C^2$, i.e $E_V = M_R C^2$. Similarly, any real energy E_R , represents a "virtual mass" M_V which is equal to E_R / C^2 .

If we take a hyper-space (HS) where the laws of physics that apply to our universe come together, we can conclude that there is a probability $P(E_V)$ with which they will give rise to "virtual energy" E_V . This then can result in real mass $M_R (= E_V / C^2)$. This M_R is the original amount of matter that eventually gives rise to all the matter/energy in the universe. This matter M_R can be either ordinary matter or anti-matter, but not both. However, given the physical laws that are operating within this universe, it is entirely possible for some anti-matter to arise under certain conditions only. Also, this mass M_R is not a singularity, but has spatial dimensions. It may be extremely dense, but is not

dimensionless because existence of a singularity is prohibited by PSTC. We can assume for sake of simplicity that it is spherical with radius 'r', but that need not be the case. It may have some irregularities with a certain maximum dimension ' r_{max} ' and a certain minimum dimension ' r_{min} '.

From PSTC we have that there is a non-zero probability P_R that the different primordial particles (PP) of this mass M_R can repel each other. At this stage the probabilistic space-time continuum is totally wrapped around M_R within the HS. If we assume that this M_R is of a critical mass M_{RC} such that when the different 'PP' of it repel each other they have the right amount of momentum, μ_C , so that the 'PP' pass the point ' r_0 ' (a concept from PSTC) for each other, then they will continue to repel each other with increasing probability. This then results in a rapid expansion of the universe or the probabilistic space-time continuum. From this, we see that initially there will be a slow expansion of the probabilistic space-time continuum, followed by a rapid expansion once the 'PP' cross each others ' r_0 '. In other words, the Big Bang will consist of two stages. The first one being slow followed by a fast and accelerating second phase. For this to happen we need gravity to "de-couple" (and be greater than the attractive effects of the remaining Unified force) from the Unified force, which may occur with a certain probability $P(G)$. Also, there has to be a certain probability $P(M_{RC})$ for the critical amount of mass M to arise so that the above events can take place. This means that the $P(E_V)$ has to be $P(E_{Vc})$. Obviously the $P(E_{Vc})$ and $P(M_{RC})$ are related due to $E_{Vc} = M_{RC}C^2$.

This means the probability of origin of our type of universe $P(O) = P(M_{RC}) P(G) P_R$. Using quantum physics and the phenomenon of particle-antiparticle pair, each of mass 'm' (i.e. total mass of $2m$), arising from empty space (thereby creating a negative energy point of $-2mc^2$) we should be able to estimate the $P(M_{RC})$. From the modified General Theory of Relativity (which is obtained using the PSTC) we should also be able to estimate P_R and from the Unified Field Theory (obtained using the modified General Theory of Relativity) we can get an estimate for $P(G)$. Hence, we should be able to get a numerical value for $P(O)$.

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For $M_R \ll M_{RC}$, the 'PP' from the matter in the universe that results will most likely repel from each other in a mono-phasic "fizzle" that it would not result in a universe like ours, but will consist of a uniform "soup" of 'PP' or elementary particles. For $M_R \gg M_{RC}$, the Big Bang never occurs because the likelihood for the first phase to occur is so small due to $P_A \gg P_R$ (where P_A is the probability of attraction of the 'PP' towards each other) that the ^{'u'} (momentum) of the 'PP' is not high enough to pass the 'r_o' of each other. Therefore, there may be only a small range for M_{RC} (similar to the goldilocks zone for our solar system) for a universe like ours to come into existence.

From the discussion so far, it is clear that the laws of physics are primary and do not require a material (matter/energy) substrate to exist, while matter/energy need the physical laws for their existence. Also, once a universe comes into existence, what occurs "within" it is completely determined and constrained by the physical laws that gave rise to it. Now, it is obvious that physical laws are just pure thoughts. Also, it is quite possible that the physical laws that operate in our universe represent only a portion of a whole universe of physical laws. This means that for our type of universe to come into existence there has to be a certain probability $P(PL)$ that our physical laws have to come together. Also, the HS in which our type of universe exists may be one of a whole universe of hyper-spaces. This then means that for our type of universe to come into existence there is a probability $P(HS)$ that the right HS combines with the right set of physical laws, i.e $P(U) = P(HS) P(PL)$, where $P(U)$ is the probability for our type of universe to come into existence. Then the actual probability for our type of universe to come into existence, $P(A)$ is equal to $P(O) P(U)$. We have found that we can determine (or estimate) $P(O)$, but it is most likely not possible to find $P(U)$ and hence $P(A)$.

Now, the HS is also a pure thought. This is so because it is a totally empty space. It is similar to the number zero which is just a mental concept without actual material existence. There is nothing with which one can represent zero, by itself, in reality. It is defined only in relation to the presence of something. Similarly, empty space is defined only in relation to the presence of

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matter/energy. If there is no matter/energy anywhere then there is no empty space either. The physical laws interact with HS to give rise to "virtual energy" E_V . This "virtual energy" results in real matter of mass $M_R (= E_V / C^2)$ and real probabilistic space-time continuum for our type of universe. Therefore, the origin of our type of universe is the result of interaction of pure thoughts. This means what existed before the Big Bang that gave rise to our universe were pure thoughts only.

