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Theory From The Big Bang to Big Crunch and Eternal Vacuum Space

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Abstract

Contemporary theories of Universe, such as the Friedmann-Lemaître Robertson - Walker (FLRW) model of the cosmos, assume that space and time marches on at a uniform, constant pace from its beginning. But what if that is not the case? It is proposed that the big bang was not the first beginning of the Universe, but rather the Big Bang may have been just a particular moment in the evolution of this always-existing universe, not a true beginning. Universe started from the shortest meaningful length, Planck Length, and the shortest meaningful measure of time, Planck Time. The observed accelerated expansion, which relates the change in the space, to change in the stretching of shrink space for the new theory, is derived. As pressure of shrink space decreases, the expansion of space increases, that is although in general, decelerate in the pressure of shrink space leads to accelerate the stretching of space. (pressure of shrink space approaching zero at the end of accelerated expansion, or all the shrinked space stretches), no need however, for dark energy. The new definition of eternal space enables us to describe a sequence of events from the Big Bang to the Big Crunch.

Keywords: Quantum Space, Big Bang Cosmology, Friedmann Equation, Cyclic Eternal Universe, Gravitational Force, Shrink Space.

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1.Introduction

The evolution of the universe is of great interest in cosmology, astronomy, astrophysics and science in general. It has implications in philosophy and religion. Theories abound on how the universe started and evolved. Most physicists and cosmologists say that…."the universe started from nothing…[1,2]". Science has made great progress in answering the question of where the universe came, through its discovery of the Big Bang. However, many observations remain mysterious and unexplained yet; they need alternative theories, models, and more experimental work in order to clarify. This is an attempt to do that.

The evolution of the universe is intimately related to its expansion and that of space. The nature of space is unknown but much debated [3]. It is generally viewed like a canvas then treated geometrically and mathematically as a surface in 4-dimensional spacetime in Einstein's Theory of General Relativity. Here, we present a more descriptive physical model of space based on the theory that the space is eternal and consists of a unique nature of shrinking and expanding. Our shrunk space model provides a rational explanation for the accelerated expansion of the universe. We follow up on this approach to predict the future and the ultimate end of the cosmos. This new theory is best understood by pictures rather than by a large number of equations.

2 . The Eternal Vacuum Space And Beginning of Universe:

Our Universe does not start out as a "Big Bang" but It is proposed that the big bang was not the first beginning of the Universe, but rather the Big Bang may have been just a particular moment in the evolution of this always-existing universe, not a true beginning. Universe started from the shortest meaningful length, Planck Length, (the smallest measure of length because shorter than it, quantum effects dominate and it becomes meaningless to consider exact values of measurements) and the shortest meaningful measure of time, Planck Time. Our model has no zero volume singularity because the size of space is eternal, i.e., the shrink space (hence the volume) cannot be zero at the quantum scale. We speculate that the space is eternal, the size of the space is finite, and it consists of a unique property, this particular and marvelous nature of space shows us that space can stretch, expand, and shrink. This property of space is causes the size of the Universe changed over time: growing or shrinking simultaneously. As the particles get closer to each other, the vacuum space should also consequently get closer. In a way, we can say that space shrunk, and as shrunk space expands, it allows particles to move away from each other. When space exponentially shrank, it creates pressure, which leads to stretching the shrink volume of space. The Force of gravity pull everything inwards, and as matter comes closer to each other the volume of space also shrinking between them and as space shrunk, it produced the pushing pressure. The pressure of shrink space produces an exponential change in the size of the Universe. The pressure of shrink space stretching the volume of shrinked space and the force of gravity contracted the universe. So, describing this way the Universe is never static, it's either expanding and slowing down or contracting and speeding up. Shrink space

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produced the pressure, and that pressure is causing the stretching of space. My ideas is simpler than some portions of the theory for the Big Bang: such as "...that the nascent Universe passed through a phase of exponential expansion soon after the Big Bang, driven by a positive vacuum energy density [4]." Whereas the proposed Theory depends upon the infinite pressure of shrunk space, which pressure caused the exponential growth of space. It is speculated that spacetime, grow in concert very rapidly at first. (In particular, that the infinite shrunk space, which stretching very rapidly at first). About 13.75 billion years ago, the infinite shrunk space produced the infinite pressure in the singularity, which pressure gave rise to the big bang, and shrunk space began to stretching. Thus the Big Bang was not an explosion of matter and radiation "all over the place"; it may just have been a silent burst of infinite pressure of infinite shrink space and, high energy radiation.

Since the variation of the Hubble constant (leading to the concept of dark energy) might well be dependent on the decreasing of pressure of shrink space. Note that if pressure of shrink space decreasing faster, than the stretching of space increasing with respect! So that processes would appear to move very rapidly in the early universe and only readily observable by detectors of high-frequency gravitational waves such as the Li-Baker [5] [6] [7]. The decreasing pressure of shrink space leads to accelerating the expansion of the Universe. Technically, the space is not creating, but the shrink volume of space is stretching or expanding. In other words, stretching shrink space is causing the expansion to accelerate by causing the decreasing in pressure of shrink space. In the distant past, the pressure of the shrunk space should have been greater, so in the distant past, the universe must have been expanding more slowly than it is today. Eventually the accelerated expansion of space, will stop at it reached its maximum volume of space. And then universe start to contracted until all the space will shrink at the Planck Length. Which we called the singularity Big Crunch. The eternal space and its unique nature of shrinking and expanding are the most fundamental quantities, which govern the cosmic evolution.

3. Results and Discussions

A. Theory of shrinking and Expanding Nature of Vacuum Space

The reality and property of vacuum space and its quantization have not been discussed much in the scientific literature. It is treated like a canvas in which a portrait of the universe as a function of time, in effect, a film recording. We have a different concept. Space is all around us, it expands, it reacts to what it contains (matter, energy, radiation). It is a dynamical entity. It grows, and Shrink. It is part of our universe and plays a very important role in it. It obeys the Theory of General Relativity like an ordinary physical object, it exhibits length contraction. It consists of its unique property of shrinking and expanding. As a participant in the evolution of the universe, we can follow and trace its progress and its ultimate fate. Our model takes it space Shrink, which is something more physical. Our vacuum space model suggests and embodies some properties of space:

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1) Pressure of shrink Space differs from gravity. Gravity is an attractive force between material objects. The shrink space force is repulsive; it exerts a pressure opposite to that of gravity.

2) The space field is a scalar field. It is similar to the gravitational field. Vacuum Space, might be the most fundamental entities in nature. There cannot be anything without space; without space there is "nothing".

3) We might point out certain implications of our model, It could be that our universe is cyclic and no beginning; there may have been Big Bangs before ours.

4) Finally, we may comment on the geometry of the universe as this topic is also quite controversial in the scientific community. It is widely accepted that the universe is "flat" and probably open, so that the law of conservation of energy is not obeyed [8]. The flatness has been challenged by Di Valentino, Silk and others who proposed a closed, spherical universe [9]. The idea goes against conventional thinking, but our model supports that view.

B. Accelerated Expansion of the Universe

The recently observed accelerated expansion of the universe has put a challenge for its theoretical understanding. As a possible explanation of this, it is considered that the most part of the present universe is filled with a form of energy that exerts a negative pressure called dark energy, which drives the acceleration.

We have have different concepts about accelerating expansion of the Universe, we postulate that the Dark Energy does not exist, and the Pressure of shrink space is might be the fifth force in the universe. Force of gravity pull everything inwards, and as matter comes closer to each other the volume of space also shrinking between them and as space shrunk, it produced the pressure. The pressure of shrink space stretching the shrinked space and the force of gravity contracted the universe. Shrink space produced the pushing pressure, and that pressure is causing the stretching of the Shrink space. The decelerate in pressure of shrink space leads to accelerating the expansion of the Universe. Technically, the space is not creating, but as the pressure of shrink space decreasing, the shrink volume of space is stretching or expanding. In other words, stretching shrink space is causing the expansion to accelerate by causing the decreasing in the pressure of shrink space. Gravitational force and pressure of shrunk space play an important role in the reformation of the Universe. Gravitational force contracted the Universe until all the matter in the universe re-collapses to a final singularity, and pressure of shrunk space expands the universe until all the shrunk space will expanded. This could account that the big bang was not the beginning of the Universe, there's always a universe before the big bang. The universe may have had no beginning — that it has simply always existed. What we perceive as the Big Bang may have been just a particular moment in the evolution of this always-existing, not a true beginning.

C. The Future and Ultimate Fate of the Cosmos

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A possibility is predicted by Rovelli's theory of Planck Stars [10, 11], that a "bounce"is more likely rather than a crunch. Using a quantum gravity approach, he showed that there is no singularity in a Black Hole because the universe undergoes a bounce due to quantum pressure counteracting the force of gravity and the volume does not shrink beyond a certain size. The universe may therefor undergo a bounce. This would lead to the "Heat Death" and "Big Feeze" often discussed in the literature. However, this will leave a lot of Black Holes floating around in the universe since their lifetime is longer than the age of the universe. This seems rather unrealistic.

The ultimate fate of the Universe with any level of certainty that will depend on how much space had shrunk, which essentially determines how the pressure of the shrunk space responds to the expansion of the universe. Because the pressure of the shrunk space will decreased at a certain level, and eventually the expansion of the Universe will stop, and then gravity will start to contract the Universe until all the matter in the universe re-collapses to a final singularity (Big Crunch).

4. Summary and Conclusions

We have elaborated on the mechanism by which pressure emanates from the Shrink space and provides the repulsive force or pushing pressure to accelerate the expansion. We have extended the unique property of eternal space to cover the period of the universe from the Big Bang until its ultimate fate. We show the picture to trace the history of the universe, the universe started from a near-singular infinite shrink volume of space with high energy density and pressure. Exponentially shrunk space produced an infinite pressure, which pressure gave rise to the big bang. It then expanded and cooled undergoing phase transitions to radiation, fundamental particles, and matter. Matter grew into galaxies, and was further consolidated by gravity into super clusters, thus bringing the universe back to contract to its initial state, ending in a Big Crunch. We speculate that the big bang was not the first beginning of the Universe. What we perceive as the Big Bang may have been just a particular moment in the evolution of this always-existing universe, not a true beginning. They are the two most fundamental quantities in the universe that govern cosmic evolution. The two principal long range forces are the gravitational force and the pressure of shrink space. This latter could be the fifth force in the universe. They may provide the clockwork mechanism that operates our eternal cyclic universe.

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