The Nature of Singularity

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In this paper, we have examined some important proposals of the big bang theory. We have also examined a few important interpretations of the quantum mechanics. We have shown that these proposals are not correct but not too far from the reality.

We have explained the mechanism of the quantum jump and quantum tunneling. We have also analyzed the peculiar motion of the galaxies.

We have shown that the singularity did appear everywhere and that the space emerged from the singularity has been expanding ever since the big bang. However, we have explained that the physical world is only a projection. The concept of multiverse or the principle of holographic universe are not correct, because the fact is that the universe is still being projected from each of the singularity. Every singularity projects the same universe because every singularity is a hologram, but this hologram is changing constantly because the information is being created continuously in the universe. We have also explained the mechanism that ensures that the hologram is updated constantly to ensure that at any given time, all the singularities project the same universe.

The gravitational singularity is a one-dimensional point that encompasses huge mass therefore density and gravity become infinite and space-time curves infinitely. The laws of physics break down in a singularity.

The universe itself is believed to have emerged out of a singularity smaller than the nucleus of an atom. This original singularity contained all the mass of the universe.

The big bang theory that the theory suggests that there was nothing in the beginning, not even space and time. The very next moment, the singularity appeared everywhere simultaneously and that the singularity did not appear in space; rather space began inside of the singularity! This moment occurred about 13.7 billion years ago.

Thus, apparently, we have had multiple copies of a single singularity. One of the interpretations of the quantum theory suggests that we have multiverses. This interpretation suggests that there are multiple copies of the universe. This is a sort of superposition of the universe itself.

String theories propose a very interesting principle called the holographic principle. Holographic principle suggests that the physical reality is only a three-dimensional projection of information stored in the form of a two-dimensional hologram on the surface of a black hole. When an object falls into a black hole and disappears forever, it leaves its imprint on the surface of the black hole in the form of information. The surface of the black hole contains all the information of the physical entities that fall into it. This information is projected back as three-dimensional physical world.

The holographic principle is offered as a solution to the black hole information paradox. We will examine it in this paper.

These are all very interesting proposals. We will examine all these proposals in this paper.

In this paper, we will explain the nature of singularity and its main features.

Results

This paper shows that the proposals of the big bang theory that the singularity appeared everywhere and that the space has emerged from the singularity may not be too far from the reality.

In our paper, *'The Meaning of Death'*, we have shown that the physical world is only a projection.[1] The irreducible element of physical reality is a non-physical entity. We have shown that every system is a hologram, but it is a hologram that keeps changing constantly. We have explained the mechanism that allows this hologram to change constantly. Therefore, every system projects the same universe.

This paper shows that every system projects the universe. The projection is from inside to the outside.

We have also explained how quasars are created. Massive stars explode into a supernova, supermassive galaxies collapse into quasars.

This paper also explains quantum jump and quantum tunneling, two of the most mysterious phenomena of the quantum world.

Methods

We will begin by examining the proposals of the big bang theory to see if its concept of singularity is valid. We will then examine the nature of systems and important features of systems to see if any system in the universe, including the biggest of black holes, has the potentiality of turning into a singularity even if it is not as dense as the singularity that emerged at the beginning of the universe.

The core of even the biggest black hole cannot have infinite density. The second law of thermodynamics ensures that no system reaches the extreme states.

The theory of relativity suggests that the clocks slow down as we move towards the core of the black holes, but does not provide causal explanation of its observation.

The clocks slow down because the optical density reduces as move towards the core of the black hole. Therefore, emission frequency also reduces because the amplitude increases without any change in the wavelength of the wave. The time cannot stop even in a black hole.

Most systems have a much lower limit of the highest optical density they can reach. The stars explode into a red giant (for example, the Sun would swell into a red giant) or even a type II supernova when their core reaches the maximum limit of the optical density they may have.

The black holes of galaxies cannot reach their highest limits. Therefore, a galaxy can only merge with other galaxies to create a supermassive galaxy. These supermassive galaxies have supermassive black holes. At some point of time, these black holes explode into a quasar just before they reach their maximum possible optical density.

These supermassive galaxies lose all their mass through the quasar. The quasars are purest forms of electromagnetic radiation. Nature ensures that all the mass is converted into electromagnetic radiation.

This is how quasars are produced. The sheer force created by the explosion ensures that quasar grow vertically.

Thus, we have resolved a major problem of the astronomy.

If singularity is smaller than the nucleus of an atom then, the statement that the singularity appeared *'everywhere'* can only mean that multiple copies of a single singularity appeared everywhere. There was no space at the time the singularities appeared in the universe; therefore, 'everywhere' can only indicate an infinite empty expanse.

Please note that the singularity of the big bang theory contains mass; therefore, if singularity appeared everywhere then, there will be no space left for the space to expand because then, we would not have anything in the universe except singularities.

The assumptions of the big bang theory create some irresolvable theoretical problems. However, a lot of it still makes sense once we realize that the physical world is only a projection. Therefore, both these problems are automatically resolved. We have already shown in our paper, *'The Meaning of Death'* that we live in a non-physical world. The physical form emerges only as a consequence of an act of observation. [2]

Thus, the existence of multiverses is a fundamental requirement in the big bang theory because space must expand from every singularity. We have already explained that this is a physical impossibility, but this idea makes a lot of sense if realize that the space is being projected from every singularity.

However, the present multiverse interpretation of quantum mechanics cannot be correct because all singularities project the same universe. If total solar eclipse occurs in one frame in the space being projected from one singularity then, it would be projected in that frame of all other singularities. Different observers may perceive this event at different times, but if they all use scientific methods to measure the actual time of events then they reach the same conclusion.

They would conclude that the event occurred at the same place at the same time for all the observers.

This is the beauty of our universe. The apparent form is relative, but underlying reality is absolute.

The multiverse interpretation of quantum mechanics does not explain these amazing features of the universe. It is purely an imaginary concept.

However, even if we assume that the space emerged out of the singularity and has been expanding ever since the big bang, we must accept that these singularities must be connected with each other is some way or the other and exchange information constantly and instantly to ensure that the space emerging out of every singularity is the same everywhere at all the times.

One possibility is that the universe is a hologram.

However, even the holographic principle does not explain the features discussed above.

The holographic principle suggests that the universe is only a three-dimensional projection of the information stored on a two-dimensional surface located somewhere outside the boundaries of the universe.

The holographic principle cannot be correct because we are not watching a prerecorded movie. The information is constantly being generated in the physical world. Therefore, the universe cannot be a projection of information stored somewhere else. The information is generated here and is projected here. Therefore, the wavefunction of an entity changes constantly. In other words, the universe not only has to be a hologram but also a hologram that is constantly changing and still updating itself constantly and instantly.

Obviously, we need a mechanism that updates information instantly because we have multiple holograms that are projecting the same universe.

In our paper on the mechanics of perception, we have highlighted the fact that the particles in the double-slit experiment do enjoy some degree of freedom, but freedom is not absolute. We have also explained that the particles cannot make any conscious decisions. In this sense, the freedom does not indicate free will. [3]

We have also shown that this observation applies even to the atoms of radioactive elements.

The universe would not have evolved into a diverse structure without the inert entities having some degree of functional freedom, but it also could not have been as orderly as it is if its constituents were to enjoy absolute freedom.

In the article referred above, we have shown that the whole controls the behavior of the parts. The most amazing example of this feature can be seen in the 'Delayed choice quantum eraser Experiment'.

In the normal double-slit experiment we observe interference pattern at the detection screen. In the next stage, the experiment is conducted with pairs of entangled partners. One of the particles of the pair goes directly to the detection screen. The other particle goes to a detector. It reaches the detector after its entangled partner has hit the detection screen. In this variant, the interference disappears even though the entangled partner reaches the detector after its partner has hit the detection screen. In this variant, a circular polarizer is used in front of the slits. The polarization is measured at the detector. This marking of the photons destroys the interference pattern.

In the next variant of the experiment, a linear polarizer is added after the detector that marks the photon. The linear polarizer erases the information. In this variant, the interference pattern is recovered. [4]

The outcome of the experiment suggests that the future can affect the past.

The argument is that the information about the path taken by the photon is erased after its entangled partner has hit the detection screen; therefore, there is no way the photon hitting the detection screen can know that the information would be erased by the experimenter.

Even the complementarity principle in itself is not enough to explain the results of this experiment.

We have already shown in our paper on the mechanism of perception that nothing physical passes through the slit. Therefore, even backward flow of information from the future to the past would not be of any use. [5]

In this paper, we have also explained that even in the normal double-slit experiment, the overall interference pattern is predictable despite the unpredictable behavior of the individual photons/electrons. We have pointed out that the behavior of the whole cannot be predictable if the behavior of the parts is arbitrary. We have explained that the particles do enjoy some freedom, therefore, the behavior of the particles is unpredictable, but the particles do not behave arbitrarily. Some mechanism controls the behavior of the particles to ensure the predictable behavior of the photons/electrons as a group.

In the above-referred paper, we have also shown that the same mechanism works even in the radioactive world to ensure that a radioactive element has a predictable half-life, despite the unpredictable behavior of individual atoms.

In all the above cases, we can rule out the possibility of any communication between the particles or any conscious decisions by the particles.

The complementarity principle is correct but incomplete because it simply states how things are without explaining why things are the way they are. It does not identify the existence of any mechanism that controls the behavior of the particles.

No doubt that the interference pattern or absence of it is the outcome of the experimental setup, but we still need a mechanism that controls the behavior of individual photons.

This mechanism is called, ‘NATURE’.

Nature ensures that the whole controls the behavior of the parts. Therefore, a system cannot be described as a group of its constituents. The constituents are manifestations of the system.

The only explanation can be that all the possible paths photons/electron can take are created as soon as we setup the experiment. Some paths may be taken by say 0% photons, some other may be taken by only 7%, and some other may be taken by only 1%. Obviously, the first photon that goes through the slits can go through any of the paths. Finally, a photon will not have any choice. It has to go through the only available path. If we continue the experiment then, the next photon will again have all possible paths available to it.

Therefore, it does not matter whether we shoot one particle at a time or shoot multiple particles in one shot. It also does not matter if we mark the photons after the entangled partner has hit the detection screen. Similarly, erasing the information after the entangled partner has hit the screen also does not require backward flow of information from the future to the past because all possible paths are fixed the moment we setup the experiment.

The fact is that no photon goes through the slits, detectors, or erasers. The pattern formed on the screen simply provides us the information about the setup.

Nature fixes these paths. None of the photons make any conscious decisions.

In the same paper, we have highlighted the fact that even in the radioactive world, individual atoms behave unpredictably but the elements still have a predictable half-life.

Suppose we have a heap of atoms of a radioactive element. The total amount of the radiation generated by the heap is fixed, but individual atoms may radiate within a small range of frequency. If one atom radiates at more than the average then, frequency of other atom/atoms is adjusted automatically. Therefore, the frequency of the heap remains constant.

This mechanism does not require any communication between the atoms or between the constituents and the system as a whole.

However, this mechanism is not enough to ensure that half the atoms should have decayed at the end of the half-life because if all the atoms radiate at average frequency then, we would have 100% photons at the end of the half-life.

Therefore, there has to be some rule or mechanism that ensures that the rule of half-life is followed.

One possibility is that the emission frequency of each atom is fixed the moment we put them in a heap. The emission frequency of the atoms is adjusted again if we move any atom out of the heap or add some more atoms.

In any case, some mechanism that controls the behavior of the parts has to be at work to ensure that the behavior of the whole is predictable.

We know that the galaxies move as an undivided whole, despite the massive spatial separation between its constituents. The galaxy, as a whole, released huge chunks of energy. The amount of energy released by the galaxy is not the sum of the amount of energy released by its constituents. The emission frequency of the galaxy determines the emission frequency of its constituents.

A peculiar feature of the galaxies is that they move in jumps. The galaxies appear to be moving in jumps of multiples of 2.68 meters per second. The jump of a galaxy is like the jump of an electron. A galaxy having an expanse of millions of light years and comprising of billions of stars separated by huge spatial distances cannot move in jumps of hundreds of kilometers per second. Moreover, a galaxy cannot disappear into nothingness for a few nanoseconds and reappear again.

We observe the same phenomenon even in the atomic world.

Atomic electron transition (also known as quantum jump or quantum leap) is one of the most mysterious phenomena of the quantum world. The observations show that the electrons jump from one shell to another. A change of quantum state of an electron appears to be a discontinuous process because electrons manifest in one shell and then, manifest in another shell after a few nanoseconds. Neils Bohr has already explained that this is because electrons absorb and emit energy only in discrete quanta. This process is not continuous; therefore, we have a property of the waves called frequency.

In our paper on the mechanics of perception, we have shown that we perceive the information generated by a physical entity, not the physical entity. All entities, including the galaxies, are mere projections of the information generated by an entity.

If information is not generated continuously then, we get blinded because of the absence of information. If there is a change in the emission frequency then, we will feel that the entiy has disappeared at one place and has appeared again at another place. This feature must manifest even in the macro world, but the interval is so tiny that we do not feel the absence of information. However, this feature will manifest itself if we use a speed gun to measure the speed of a vehicle.

Can we say something about the state of the electron or galaxies in the period we get blinded?

Yes, we can say that nothing unusual or mysterious happens to these entities in the period we cannot observe them because of the absence of information. We know that all the entities exist in non-physical form and continue to exist in the non-physical form during the period we cannot observe it. It is not possible to observe the galaxies or the electrons during the period we get blinded but we can be sure that there is no violation of the first law of thermodynamics.

This analysis also resolves the mystery of quantum tunneling.

If we roll a ball up a hill, but ball does not have enough velocity because it does not have enough energy then, it will roll back towards us. However, in the quantum world, particles can break this barrier and roll over the hill without having the required energy.

This is the most simplified explanation of quantum tunneling.

The fact is that the particle does not move physically from one point to another. It simply disappears at one place and appears at another place.

An often asked question is, *'why electrons absorb and emit energy only in discrete quanta?'*

The particles enjoy some freedom within the whole so that we can have a diverse universe. The energy is absorbed and emitted in discrete quanta to ensure the longevity of the universe. In the absence of this feature, the process may end the moment as soon as they begin. These are the mechanism of Nature.

This analysis shows that we may have infinite singularities existing simultaneously. These singularities project the same universe. However, it will be prudent to first verify that we do have multiple singularities and that each singularity is a projector.

Cosmologists have observed that the farthest point in all directions from any point in space is always located at a distance of 14.7 light years; therefore, it appears that every point in space is the geometric center of the universe. Recent findings of the GEO600 experiment also indicate that the Earth is the geometric center of the universe. In other words, it confirms the observation that every system is located at the geometric center of the universe irrespective of its position in the universe. [6]

This is a physical impossibility, but the problem is that it is an indisputable fact.

NASA explains the reason and concludes that though every entity may appear to be at the geometric center of the universe, but is not really located at the geometric center of the universe.

In reply to a question, *'Are we located at the geometric center of the universe?'* NASA's 'Ask an Astrophysicist' facility explains, *"Astronomers and astrophysicist interpret the result that all galaxies are flying away from us as evidence for the uniform expansion of the universe.*

In this case, any observer, at any location of the universe, observes the same general motion: that the further a galaxy is from us, the faster its relative velocity with respect to the observer is. The famous (and very illustrative) example of this is to imagine a loaf of raisin bread as it is baking.

The resins in the bread spread away from one another as loaf rises and expands during the baking. Pick any raisin and pretend you are standing on it (you are very small now!) and measuring the rate at which other resins are moving away from you. You will find that no matter which raisin you choose, all other raisins appear to be moving away from you, with the furthest raisins receding the farthest.

The current cosmological model supposes that our position in the universe is typical, not special. We are not located at the center of the universe but are rather taking part in its global expansion." [7]

The problem is that a person located at any raisin close to the edge of the bread will know that he is not located at the geometric center of the universe. This explanation of NASA only explains why all galaxies appear to be moving away from each other, with the furthest galaxies receding the farthest. It does not answer the question.

NASA also does not discuss another important feature of the universe that leads to the same conclusion.

Ethen Siegel explains: *'The big bang did not happen at a point, and the way we can tell this is through the extraordinary high degree of isotropy and homogeneity of the universe (it is so good that when we notice a homogeneity that's 0.01% of the universe's average, we wonder if something is wrong!).*

So, if you want to assert that the big bang happened exactly where you are, and that you are at the center of where it all started, no one can tell you that you are wrong.

It is just that everyone, everywhere, in the entire universe is just as right as you are when they make that claim, too."[8]

In the article on the nature of space, we have explained how the expansion of the universe can be isotropic and homogenous despite the random distribution of the matter.

We have shown that the conclusion of the big bang theory that singularities appeared everywhere simultaneously is correct. However, its assumption that the space has emerged from these singularities and is expanding constantly is scientifically untenable.

Even this explanation does not answer the original question. Let us modify the question.

The *actual measurement of the redshift* shows that the farthest points of the universe in all directions are located at equidistance from us. Therefore, we appear to be at the geometric center of the universe. However, our position is not special because this is true for all the systems. *How is it possible that every entity, irrespective of its position in the universe, appears to be located at the geometric center of the universe?*

Since the universe is a non-physical entity therefore, its physical manifestation can only be a projection, which means we can have multiple projections of a single universe. Since every entity is projecting the universe from inside to the outside therefore every entity appears to be located at the geometric center of the universe.

Every system is a projector. Obviously, the universe is projected from inside to the outside from every system; however, in case of inert entities, the projection is not in physical form. Inert entities do not have any sense of the physical or temporal expanse of the universe. Animals have a sense of the physical expanse of the universe but not of the temporal expanse of the system. Only human beings have a sense of both the physical and temporal expanse of the universe.

These findings show that every system is a hologram. Every human being projects the entire universe in the physical form, but does not realize that everything is inside him. A human being

can manifest only those properties as his own properties that it has the potentiality to manifest in the physical world. An entity must acquire the potentiality to manifest a property in the physical world then only the entity can manifest that property in the physical world.

We have already shown that it is possible that the information within the hologram keeps on updating instantly.

A system is a non-physical entity.

Discussion

The weird looking quantum world has provided us with the opportunity of looking at our universe from an entirely different perspective. This analysis shows that the quantum world is not weird. All the phenomena we observe in the universe manifest even in the macro world.

Some observations of the big bang theory also appear very strange, but these observations are not far from the truth.

The macro world and the quantum world follow the same set of laws. An act of observation may disturb a system in the quantum world. Even the measuring device can have observable effects on the outcome of experiment, but it does not mean that the quantum world behaves differently.

The uncertainty principle is not entirely correct. In any case, it only describes our observational limitations. It definitely does not allow us to imagine that the fundamental laws can be violated for the brief period allowed by the uncertainty principle.

The laws of nature are observer independent.

In our paper on the reality of relativity, we have shown that even the expanse of the universe is observer-dependent.

All these phenomena can manifest in the universe only if it is a non-physical entity, and because it is only a projection.

How strange it is that we do not even know that the essence of our being is a non-physical entity that encompasses the entire universe.

Just think about it!

To say that each one of us is the complete universe would be wrong because each one of us projects the entire universe. The universe is not a real entity; we are the real entity.

In two of our previous papers, we had mentioned that the apparent forms of entities exist in the state of superposition. These findings also mean that we have to give up the idea of that apparent forms exist in superposition. There is no superposition of any entity, not even of the universe.

This paper resolves several major theoretical problems and manifests some of the most amazing features of the universe. However, it also raises several important questions. We will answer these questions in our next paper.

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