An analysis of Big Bang theory as a work of fiction

Sunil Thakur
www.norlabs.org
sunil.thakur@norlabs.org

I desperately tried to analyze big bang theory as a theory of physics that supposedly explains the process through which universe was created. The theory makes so many assumptions without explaining the scientific logic behind such assumptions that we have no choice but to treat it as a work of fiction. In fact, even a good work of fiction is supposed to have logical sequences and a good fiction writer takes great pains to logically explain the behavior of its characters. Even though big bang theory does not even qualify to be a good work of fiction yet it needs to be analyzed because many of us believe that it logically explains how the universe was created.

Let us examine the cosmological model as well as big bang theory.

Big bang theory suggests that universe is expanding with the space. The FLRW matric suggests that if we have all objects plotted on a grid then expansion has to be explained through the expansion of grids. The objects remain at same coordinates or same grids and the number of grids remain the same but the area covered by each gird increases and hence the distance between each grid increases too.

This proposal assumes that space and universe (matter) are two different entities but as mentioned earlier, anyone who understands a bit of general relativity knows that as per general relativity, objects are mere spacetime structures.

FLRW matric assumes that galaxy is an object but we know that galaxy is merely a combination of several stars with huge spaces between them and hence with the kind of expansion of the grids suggested by the matric, instead of galaxies moving away from each other, the stars within every galaxy should move away from each other. If expansion of space is uniform in all directions then such uniformity must be seen in all structures and not just universe in general. We do not see galaxies expanding in size, we see the distances between galaxies increasing. This means that the distance between the grids in increasing while grids themselves must not expand. What we observe is quite opposite to what FLRW matric suggests.

Mass and volume are not the physical entities themselves but are the properties of the physical entities. Therefore, mass and volume cannot increase unless there is a corresponding increase in the energy of the universe. Since there is no doubt about the validity of the first law of thermodynamics therefore it is obvious that volume of the universe can neither increase nor decrease.

We are not sure whether the density of the universe is 1, is more than one, or is less than one. Nothing in the universe, including the density is same at all points because distribution of matter is not equal across the space. Temperature of the universe varies at different points and so does density. There are placed where density of the space is higher than the average density of the universe and there are spaced where density is lower than the average density of the universe. Average density of the universe has to be one and universe must expand at the places where density is more than one and universe must contract at places where density of the universe is less than one. CMBR anisotropies gives good indication of these areas where density variations exist. Universe is moving towards the absolute zero and this temperature will be achieved when energy distribution across the universe will be equal and hence density will be same across the universe.

This analysis rules out the possibility of metric expansion of the universe.

Let us examine the suggestion that in the first few days universe was in perfect thermal equilibrium.

To know the magnitude of the 'few' and to know the meaning of the 'day' when there was neither the earth nor the sun, we have to make lots of assumptions. Considering that day means 24 hours of time as per our present day clock, we need to account for the expansion of time. Due to the lack of any definitive statement, we can not examine this proposal scientifically. A scientific theory must explain the number of days esp. when it can make predictions about the events in the first 10^{-37} seconds of the universe and makes more definitive statements about the events after 10^{-11} seconds.

If cooling down of the universe is being attributed to the expansion then universe cannot be in thermal equilibrium after a few days unless the matter was distributed equally in the universe and temperature of the universe was constant for a few days which means there was no expansion of the universe. Once again this proposal contradicts theory's own proposal that universe is expanding constantly. If matter was distributed equally in the universe even after a few days then we cannot explain emergence of large scale structures.

Big bang theory suggests that baryons were formed at around 10^{-6} seconds as the temperature of the universe had reduced considerably and hence protons-antiprotons were not being created. Experimental evidence do not suggest that particle-antiparticle pairs are not formed below a critical temperature level. Moreover, we have to assume that at temperatures above the critical level, the pairs were constantly being created and were getting annihilated and therefore theory must predict a gradual increase in the protons and neutrons.

After a few minutes of expansion, temperature of the universe was just about a 1 billion Kelvins and density was about the density of the air!!!

This is an extraordinary suggestion.

Just try and explain the present day universe from this situation. The cooling down of the universe is because of expansion and therefore it shall not lead to the contraction and hence density of the matter must go down constantly. How do we explain emergence of large scale structures (LSS) from this situation esp. when the density was so low?

If we try and explain big bang nucleosynthesis then we do not leave any scope for emergence of LSS and if try and explain creation of LSS, nucleosynthesis cannot take place.

Big bang theory does try to explain creation of LSS by introducing slightly denser regions. This is against what we have been told so far. These slightly denser regions gravitationally attracted nearby matter to form gas clouds, stars, galaxies, and other structures observable today.

If general relativity is correct and if whatever big bang theory proposes is correct then creation of stars and galaxies has to be explained through different processes. Galaxy is not an object and stars are objects. Galaxy does not have its own mass; its mass is sum total of the mass of all the objects existing in it. We make the same mistake of treating systems as objects even while analyzing gravitational force. We cannot explain evolution of the systems and the objects though the same process.

Now let us examine the CMBR, the supposedly biggest evidence of the theory as it validated the prediction of the theory.

The prediction was that if universe was very hot after the big bang then, this heat must survive and the fact that CMBR exists validates this prediction. Expansion of the universe allows it to cool down.

We have already ruled out the possibility of the expansion of the universe and hence the theory must find something else to explain cooling down of the universe. The heat cannot escape the universe and hence we cannot have any logical explanation for cooling down of the universe.

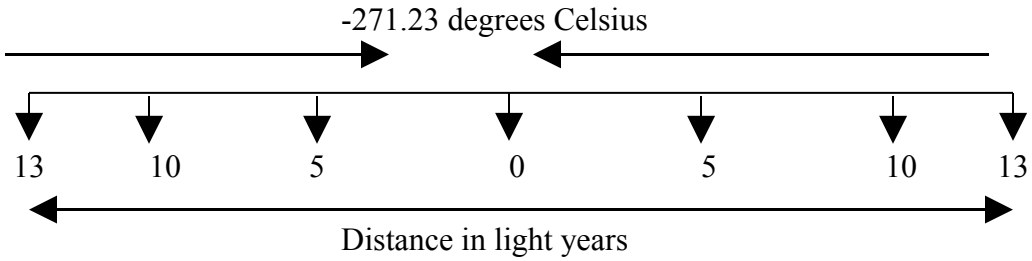
Our present understanding is that CMBR is a relic of big bang and was created about 380,000 years after the big bang when photons decoupled from the matter about 13 billion light years back.

CMBR gives us information about the entire universe irrespective of the place we observe the CMBR from. To reduce the noise, we may select a specific location to map the CMBR but technically such a location is not different from any other location in the space.

If what we have traced are the photons that had decoupled from matter about 380,000 years after the big bang then we have to assume that each photon is present at every point of the universe and that too in a manner that all photons reach all the points and stay at all points exactly at the same time irrespective of the distance they are coming from. Even if

we assume that a single photon can be present at all placed in the universe then we must get absolute information about all points and not the relative information that CMBR gives us.

Once again, we find that our interpretation of the information CMBR provides is not correct and that we tend to ignore more important points and concentrate on trivial issues. In one part of a theory we believe that information cannot be communicated instantly but in the other part we claim that we know the current state of the universe. We cannot make any statement about the current state of the universe unless we believe that information is communicated instantly.



The temperature of the universe is almost same at all points except at places where matter is present. The temperature of the CMBR at a point 13 billion light years away is same as the temperature of the CMBR outside the atmosphere of the earth. Now the photons supposedly originated from the point 13 billion years ago had the same temperature as the photons coming from one inch away. On the other hand, if we assume that photons cool as they travel across the universe then photons coming from 5 billion light years shall be hotter than the photons coming from 13 billion light years. If we assume that distance has nothing to do with the cooling down of the photons because photons cool with the passage of time then we have to assume that conditions across the universe are same but we know that this proposition is not true.

Since big bang theory, the theory that predicts the existence of the CMBR, firmly rests on the validity of the theory of relativity therefore the temperature we are receiving from the point of the universe 13 billion light years away has to be the temperature of the universe as it was 13 billion years back.

We can sense the photons at the place they are generated and at the time they are generated; similarly, all the sensors, mirrors, and telescopes can also sense the information instantly. (Please read my papers, ‘Human eye can instantaneously detect action at a distance’, Do we need to absorb photons to be able to see light?’, and ‘Total solar eclipse invalidates theory of relativity’ that provides ample evidence that information can be communicated instantly). Therefore CMBR does give us instant information about any point of the universe.

In any case, if big bang theory believes that CMBR gives us information about the past then also it is invalidated and if it believes that CMBR gives us instantaneous information then too it is invalidated because it is self-contradictory.

If heat released at the time of big bang has survived till date then the heat being released in the universe ever since the big bang also must survive in some form. How is it that heat released at only a specific moment has survived?

It is a poor attempt to connect imaginary 'de-coupling of photons' from matter with a prediction that has nothing to do with CMBR.

Even if we assume that we are uniquely placed at the center of the universe, our interpretation of the CMBR cannot be supported by our present theories including theory of relativity and even big bang theory because it agrees with the suggestion of the theory of relativity that we can only look back in time.

This being so, at the time of the big bang the temperature of the universe at a point 13 billion light years away should be what it is today. Therefore, the idea that photons released soon after the big bang is wrong. If theory of relativity is valid then CMBR map only shows that temperature of the universe has not changed with time.

If information does not travel instantly then we cannot make any statement about the current state of the universe.

What does the term 'decoupling of the photons from matter' mean and how is it connected with the heat of the big bang? What is it that is cooling down; the photons, the heat, or the matter that remains in the universe?

Once again, we find no explanation of the cause and the process that resulted in the decoupling of photons from matter.

I do not think that we need to even examine the proposals like 'the time expanded for a while' or the proposal regarding survival of just the right number of hadrons in the matter-antimatter collision because the theory does not give any scientific basis for such assumptions and does not quantify this imaginary proposals. 'For a while' can be as long as one can imagine so like poor fiction writers, theory leaves a lot to the imagination of the reader. It is like a murder mystery wherein murderer enters in the last scene and writer finds some unique way of connecting him with the murder.

Big bang theory is like a religious story that expects us to believe blindly in whatever is being stated. At least, religious stories are far more interesting.

Expansion of time has no meaning because Einstein has shown us that time flows at different rates at different coordinates. Unless we assume that time was flowing at a uniform rate throughout the early universe, going back in time will create a situation wherein some parts of the universe achieve a state of perfect order earlier than other parts and hence we will need more than one singularity but even then expansion of time cannot have any meaning because expansion and contraction of time is possible only if we have a standard reference time against which we can make comparisons and if time was

flowing at the same rate across the universe then no experiment of physics can show whether time is expanding or contracting.

If expansion of time has some functional effect on the universe then we must know exact duration for which time expanded and must logically establish the relationship of time with the suggested affect.

If fundamental forces came into existence after the big bang then we must know the process that caused evolution of fundamental forces. It is difficult to imagine that fundamental forces could have emerged suddenly without causing major structural changes in the universe. Just imagine that there was no gravitational force in existence and then suddenly in one moment someone turns a switch on and gravitational force and theory of relativity come into existence in a universe where distances between entities might have been just a fraction of the distances today and yet universe does not collapse back into a singularity.

Big bang theory is suppose to keep any divine intervention out of the creation of the universe but then it requires divine intervention at so many different stages that in itself it proves the existence of God beyond any doubt.

There is no scientific basis behind proposals like ghost-like appearance of antimatter that quietly destroys almost all the matter in the universe but has some mercy and leaves 4% matter and then disappear again quietly never to return back. What an imaginative proposal this is. Science and esp. physics would be a much easier subject to study if we can have more such proposals to resolve theoretical problem we face.

The suggestion that 4% of the matter survived by chance shows that we have no idea of the processes involved and it is just a creatively imaginative suggestion based on our current knowledge that we are left with only 4% perceptible matter. If we find tomorrow that our estimates were wrong and we are left with only 1% matter then big bang theory still survives because it believes in chances and its proposals are unscientific.

I think a better proposal is that God suddenly felt that he must create a universe so that a few billion years later human being can worship him so he moved a magic wand and universe emerged like a ghost. How can theory of big bang question this assumption about God creating the universe? Its own proposal is as imaginative as the above proposal. The proposal that universe was created when God moved a magic wand is as imaginative as big bang theory but a hell of a lot less complicated than big bang theory. If we have to be imaginative then let us go for an imagination that can be grasped by everyone.

Let us have more sense and less imagination in science.

Let us examine the possibility of rolling back the time by analyzing a speech delivered by Mr. Stephan Hawking titled, ‘The Beginning of Time’.

Let us examine the proposal that laws of physics break down at singularity. Let us find out what we mean by a 'Law of Physics'.

'A fundamental law of physics is supposed to be a statement about a specific structural or functional aspect of the universe that does not change with the space, time, and observer.'

Even if a law is not a fundamental law; it must hold good in the conditions specified in the law.

Break down of a law of physics can only mean its invalidation. A law is an observation and not a physical entity that can disappear or breakdown. An observation can only be valid or invalid, it cannot disappear therefore the suggestion that laws of physics break down at singularity does not make much sense.

"**A law of physics is the description of an observation that is supposed to be valid in specific set of conditions.**"

If we assume that there were no deterministic laws in existence at big bang then we cannot explain how universe evolved from the big bang. If there was chaos at the time of the big bang then there cannot be any deterministic laws now esp. as nothing new has happened in the universe ever since big bang. The only qualitative change is that somehow antimatter emerged and destroyed all the matter and that universe is expanding ever since the big bang.

As per big bang theory, expansion of the universe has to be the only cause for every development that is taking place in universe but theory does not relate any of the developments with expansion.

Let us be clear about the fact that first law of thermodynamics is about energy and its properties. Big bang theory suggests that all of the energy of the universe was created which simply means that as per big bang theory, first law of thermodynamics is invalid and therefore it cannot be a fundamental law of nature.

First law of thermodynamics is based on our observation that energy cannot be created or destroyed and now we find a situation wherein energy was created and hence we can only conclude that first law of thermodynamics is not valid. If this is so, then we shall be able to create and destroy the energy.

If energy can be created then we must have the evidence of it in the observable universe unless some agency was granted special one-time powers to create all the energy.

Since, our observation about the conservation of energy is based on experimental data and our observation about creation of energy emerges out of our imaginative powers therefore we have to trust that first law of thermodynamics is valid. Scientifically, we can only say that we do not know how the universe came into existence but all the evidences

suggest that energy cannot be created or destroyed and therefore universe has to be an eternal structure.

The idea that space and time were created does not emerge from any observations in nature but is the outcome of theory of relativity and therefore it creates a direct conflict between theory of relativity and first law of thermodynamics. Even after more than a hundred years, theory of relativity does not enjoy universal acceptance but more than that Einstein himself believes,

"What appears certain to me, however, is that, in the foundations of any consistent field theory ***the particle concept must not appear in addition to the field concept****. The whole theory must be based solely on partial differential equations and their* ***singularity-free*** *solutions."*

We have suggestions that second law of thermodynamics suggest that universe is moving towards increasing disorder and hence there must have been a beginning or else universe will be in perfect disorder by now.

There is an inherent contradiction in this argument. If we believe in the validity of second law of thermodynamics and going by the second law of thermodynamics, if we roll back the time then, we are bound to get a state when universe was in perfect order and not a time when universe had a beginning because beginning means that there was neither order nor disorder. The suggestion that without a beginning universe would have been in perfect disorder by now does not make sense because we know that entropy of the universe is increasing and we are not in a static phase of the universe. The process is definitely on and has not been completed as yet and we know that the universe is heading towards perfect disorder when the energy will be distributed equally at all points of the universe. There is no logic to suggest that if universe did not have a beginning then we should have achieved a state of perfect disorder by now. We have more than ample evidence to suggest that universe has not achieved a state of perfect disorder but it is moving towards a state of perfect disorder.

Einstein has conclusively proved that time does not run at the same rate at coordinates of space and therefore rolling back of time does not guarantee anything except that a state of perfect order will be reached at different coordinates at different times. Therefore, we need more than one singularity and more than one big bang to explain the current state of the universe.

Big bang theory also does not explain whether a state of perfect disorder will mark the end of all the energy of the universe? It cannot be because second law of thermodynamics suggests that this stage is being achieved gradually and hence if a state of perfect disorder marks end of all the energy in the universe then we must experience loss of energy. In any case, no one has suggested that laws of physics will break down when universe achieves a state of perfect disorder and hence we have reasons to believe that first law of thermodynamics will be valid even in that state.

If state of perfect disorder does not mark loss of energy but will only lead to the contraction of the universe then what makes us believe that a state of perfect order means beginning of the universe or creation of all the energy in the universe?
I have already discussed the nature of light in my articles and quite comprehensively in my book, 'Nature of Reality' and this observation does not make much sense after we understand the true nature of light and that universe has cyclical existence.

No one suggests that the stars have been shining eternally; we know that stars are created and destroyed (change of form) quite regularly in the universe. Energy has no discernible properties and hence it may stay in a form that remains unperceivable to us (as is the case with dark matter and dark energy).

What philosophy considers as development is only a change of form in science. Change of form is a process that goes on continuously in the universe. Creation and annihilation, birth and death, development and deterioration, and order and disorder are not scientific terms. Nothing develops or deteriorates in nature; everything changes form and change of form is a continuous process.

Without understanding and discussing the concept of time and the concept of time dilation mean, we cannot suggest that time had a beginning.

If time had a beginning then it must have an end and big bang theory does not explain how the space and time came into existence (it merely states that space and time emerged from nowhere) nor does it bother to explain how space and time will disappear.

Big bang theory suggests that we cannot have any logical reason for the emergence of the stars in a static universe.

Without suggesting that the stars were lighted in one moment, I find this observation very interesting because we do not need any dynamical reason for emergence of the entire universe but want a dynamical reason for one of the events in the universe.

In fact, discovery of voids has conclusively invalidated big bang theory because appearance of such huge voids (one of the voids extends 3.5 billion light years) cannot be explained within the finite time we have as per big bang theory. The voids also suggest that gravity causes galaxies and clusters of galaxies coming closer over time resulting in creation of huge voids between them.

Therefore, the idea that since galaxies are running away from each other and hence they must have been close together at some point of time is at best inconclusive.

Now, let us examine the suggestion that all the matter was on top of itself and that density was infinite at singularity.

We feel that events before the big bang have no observational consequences so that we need not discuss them? A series of events that can give us possible clues about how

energy can be created must have enormous observational consequences. Big bang theory just does not have any logical explanation for the creation of the universe therefore it has no choice but to resort to such suggestions.
Even though it may appear that big bang theory suggests that universe was created with big bang, almost all of its proposals indicate that it simply suggests that it does not know what happened before the big bang and therefore it suggests that time had a beginning. Our failure to see beyond a specific point does not allow us to conclude that nothing exists beyond that point.

All the dynamical laws of the universe, including the second law of thermodynamics require us to assume that universe is eternal structure. Order can emerge only from disorder or disorder can only emerge from order and order and disorder can only be a feature of an existent entity and not a non-existent entity.

The logic of no-boundary proposal is not very scientific either. We cannot use the analogy of earth having no edges or no boundaries from where one falls and goes on to suggest that universe can also have no-boundaries. The earth has definite boundaries and if it were not for the gravitational force we will indeed be thrown out from the earth. The fact that even when we travel all across the earth, we do not find any edges does not mean that no edges exist. All the time, we are living on the edges.

A scientist cannot escape the scientific scrutiny by making unexplainable, non-testable, hypothetical statements.

Big bang theory cannot be classified even as a good work of fiction.

****