Compatibility of a Model of Time, ‘Time is a Measurement of Aging’ With Certain Aspects of the Theory of Relativity

Dayalanand Roy

Associate Professor, Department of Zoology, SMM Town PG College, Ballia, U.P., INDIA, 277001

DOI: 10.29322/IJSRP.10.02.2020.p9817

Abstract- The present article is based on a new model of time- ‘Time is a measurement of aging’, or, said in other words, ‘Time is the fourth dimension of objects’. It is based on the assumption that time is not a requirement for aging of objects- animate or inanimate, that is, it is not a cause of aging. Rather, time is an acquirement through aging, an effect of aging of objects. In other words, the measurement of aging of objects- their extension into their own fourth dimension- itself is time; just as the measurements of spatial dimensions of objects- their extension into their own three spatial dimensions- make their length, width and height. The latter are acquired by objects through their growth; they are not any independent entities. Time too is acquired by them through their aging and is not any independent entity. Further, this article attempts to verify the compatibility of this model of time with certain aspects of the theory of relativity. The article shows that the model fits well with time dilation as well as the curvature of space-time- the principal aspects of the Special and General Theories of Relativity, respectively.

Index Terms- Time, Measurement of Aging, Fourth Dimension, Relativity, Time dilation, Curved space-time

Time is the Measurement of Aging

I have described time as a measurement of aging. By the term ‘aging’ I simply mean to ‘grow old’ and by the term ‘age’, I mean the world-line or the fourth dimension of objects. A brief description of this model follows here.

Time is not a requirement for aging

Whether it is an animate or inanimate object, everything grows old, and hence, everything ages. How do objects grow old? Many people will answer that objects grow old passively, simply with the passage of time. Time seems, according to these people, to be a requirement for aging, or a cause of aging. This is the time that Newton considered as ‘true’ time that passes equally and independently of things and their changes.

But, if we take time as a requirement of aging, time will have to be an independent entity, like matter or energy, and there shall have to be some mechanism by which it should interact with objects to make them old. But neither there is any evidence of time to be an independent entity, nor of any mechanism by which could it interact with objects to make them old. This Newtonian; or, ‘requirement-for-aging’ form of time could never be proved to exist at all. Instead, it can be easily seen that aging of any object depends simply on its own reactions and interactions. It is the ‘times’ of reactions and interactions an object undergoes that is responsible for its aging, rather than ‘time’. And hence, aging is not a passive phenomenon. Rather, it is an active phenomenon. Objects have to earn their aging, acquire their aging, by undergoing a number of reactions and interactions a number of ‘times’. Time does not seem to be a requirement or a cause of aging.

Time is an acquirement through aging

All that we know of time is simply from changes occurring in our surroundings, sunrise and sunset, changes in weather, movement of celestial objects, growing children and senescing elders. Whether do we have any inkling of a river of time flowing in space, nor is it needed at all to invoke such a concept of time to explain any of our worldly phenomena. Then, could the movement of celestial bodies, sunrise or sunset cause the aging of objects? Obviously, they cannot. After all, these celestial bodies themselves too get old.

Aristotle was probably the first who recognized this fact that things change continually. Time, for Aristotle, was just a measurement of this change. I have based my model of time on
this Aristotelian time. All the changes that an object undergoes lead to its aging. We also measure aging in terms of the units of time- seconds, minutes, hours, days or years.

When an object- animate or inanimate- grows, it progresses in its three spatial dimensions- length, width and height. And when an object gets old, say, it follows its world-line; it progresses in its own fourth dimension- its age. For example, when a small plant grows, it progresses in its length, width and height- the three spatial dimensions. And as it grows, it gets old too, and consequently, it progresses in its fourth dimension- its age. Just as the three spatial dimensions (length, width and height) of the plant are acquirements through its growth, not requirements for its growth; similarly its fourth dimension (age) too is an acquirement through its aging, not a requirement for its aging.

Time is just a measurement of this aging of objects- animate or inanimate. Or, in other words, time is the fourth dimension of objects that they acquire themselves. It is not, I think, a readymade fourth dimension of space in which they age; just as the three spatial dimensions of objects are to be acquired by them too- they too are not present readymade in space. Thus, time too is an acquirement through aging, not a requirement for aging. Just as length, width and height are not thrust upon an object from any invisible river of time flowing in space- there is none such river; time too is not thrust upon it from any invisible river of time flowing in space; there is none such river too. If objects do have three spatial dimensions, why can’t they have one more dimension- the fourth dimension or the dimension of time? They do have their fourth dimension- the dimension of time.

Length, width and height tell how large an object is; time tells how old it is.

So, why should we keep tagging time- the fourth dimension- only with space, when we know nothing of space that what it is. Tagging time with space, instead of objects, is, in my view, at the center of all problems, all myths about time. Think of objects, instead of space, as four dimensional entities and all the enigmas of time will disappear.

Now, let us test the compatibility of this model of time with the principal aspects of the Theory of Relativity- time dilation and curved space-time. 

Time as a Measurement of Aging and Time Dilation:

Einstein’s Special Theory of relativity says that two events which are simultaneous for an observer standing nearby may not be simultaneous for another observer who is moving at a fast speed. It further says that time delays for a moving object- the faster it moves, the slower becomes the time for it. If a clock is moving at a fast speed, it seems to slow down to an observer at rest. In other words, time dilates during motion; it is not absolute.

Now, let us consider a little deeply the question- why should moving clocks record a time different from that recorded by a stationary clock; why should the time read by different clocks placed in different reference frames should not necessarily agree with one another?

The definition of time adopted here- time is a measurement of aging- the fourth dimension of objects- presents a probable solution to this question. Special relativity says that length contracts and time dilates during motion. Length is a dimension of the moving object and it contracts. So when time dilates during motion, why should it not be a dimension of the moving object too; why should it be a dimension of “space”? I think, of course, it should be a dimension of the moving object too. ‘When something moves at a high speed, its time dilates’- this statement simply means- while moving at a high speed, it ages less, or, say, acquires less time.

The clocks too, like any other object, age; and their aging is marked by movement of their hands that we read as seconds, minutes, hours, etc.- these markings are the time stones of a clock- just as the spatial extension of a road is marked by mile stones; or that of a measuring rod by millimeter, centimeter and meter. A tree grows and acquires height; and we can mark its different heights- one meter, two meters… eleven meters etc. Along with acquiring the height, it acquires age too. We can mark its age also- one year, two years…. eleven years, etc. Just as a measuring rod is equipped with self-marks to measure its own length and then, by comparison, the length of other objects; a clock too is equipped with ‘self-marks’ with the help of some periodic motion to measure its own aging process and then, by comparison, the aging process of other objects.

Now, let us come to the issue of time dilation. We shall not expect that, in the above example, the tree should grow equally and acquire the same height in every condition or every reference frame. Similarly, if we accept that time is an acquirement too by aging- a measurement of aging, why should we expect that the tree should age similarly and acquire the same amount of age- its fourth dimension, or, its ‘time’ in every condition or every reference frame? And by the same logic, why should we expect that the clock should age similarly in every reference frame in every condition. It ought to age differently in different reference frames and hence, the measurement of its aging- its time too should read differently in different reference frames. Accordingly, a second read by it can justifiably vary in different reference frames.

In a mechanical clock, its gears are moving as part of its aging and, in the process, are marking up and measuring its aging. So, we may make howsoever a good quality clock, but why should we expect that the clock will change identically, age identically and its gears will move identically in every condition- whether it is standing still or moving? They may move differently and they do so.

If it is an atomic clock, the vibrations of cesium atom are part of the aging phenomenon of the atom and they are used to mark the aging of the atom and the atomic clock, thus giving us the reading that we call time. So, why should we expect that the cesium atoms should vibrate identically; whether they are stationary or moving? We have no way to prove that they will vibrate identically in every condition, whether stationary or moving. If we can prove it, we shall disprove relativity. They can vibrate differently and they do. Hence the reading of the clocks in different reference frames- one stationary and the others boarded in airplanes flying eastward and westward- do not agree¹. Hence the theory of relativity says, simultaneity is not absolute, it is local.

As far as I have noticed, Einstein hardly says anywhere in his works that it is time that is delayed during motion. Almost always he predicts about the behavior of clocks, not time. If time is not an independent entity, it is not a requirement for aging but
an acquirement through aging, then every object- be it a clock or something else- will acquire it independently and, quite possibly, differently, if located in different reference frames. Let us read carefully what another physics giant, Richard P. Feynman states about relativity-

“For instance, if we watch a guy going by in a spaceship we see that things happen more slowly for him than for us. Let’s say he takes off on a trip and returns in 100 seconds flat by our watch; his watch might say that he had been gone for only 95 seconds. In comparison with ours, his watch- and all other processes, like his heartbeat- have been running slow.”

So, along with his watch, all other processes- his heartbeat and everything else- are running slow. Hence he ages less. Hence his watch ages less and reads less. Hence he acquires less time. This is what, as I understand, is the direct meaning of this statement. It clearly demonstrates the meaning of time. Why should we derive a hypothetical meaning of this statement that since the time for the moving guy slows, hence all his processes- his watch and his heart beats- slow; when neither do we know that there is an independent entity called time on which our watch and other processes depend, nor have we any inkling about the mechanism by which it can interact with our watch or our other processes to make them slow. Nor do we have any such necessity to invoke the concept of an independent time. Let us grasp the direct meaning of time that this curious and bold statement is conveying to us: it is a measurement of the extension of objects in their fourth dimension, a measurement of their aging; thanks to Einstein and his relativity principle that enables us to reach this conclusion.

Special Theory of Relativity is about relative measurement of space and time in different reference frames. A man runs for 1 hour on a track. Another man flies for 1 hour in a spaceship. How do they come to know they have run or flew for 1 hour? Invariably they have to depend on some clock like device to know this. They can depend upon a mechanical clock, an atomic clock, or upon some of their biological clocks- number of breathes, pulses, heart beats or something like that. Whether it is a clock- mechanical or atomic, or it is a biological clock: all of them are aging- getting old- and measuring their own age by reading some of the changes going in them. By comparing with these devices, we measure the aging phenomena of other things- say the time of other things, like our own. And it is by no means guaranteed that things will change and age equally and identically in all circumstances. The heartbeats, pulse rates or breathes of the runner on the track may vary from that of the flier; likewise, their mechanical clocks may also vary in what they read.

We cannot prove that atomic clocks are not unaffected by a wide range of speeds. And we have no reason to think so, because at different speeds, the components of things may behave differently and age differently. And by our definition, time is just a measurement of this aging. Thus, time must vary in different reference frames. One hour of the track runner and one hour of the flier should not be the same, if, according to the definition of time adopted here, time is a property of objects, the fourth dimension of objects, the measurement of their aging.

I find a strong support from Barbour to the view that the clocks running at high velocity may go slow-

“There is nothing inherently implausible in the idea that clocks travelling past us at high speed should be observed to go slower than the watch on our wrist. Motion of the clock might well alter the rate at which it ticks.”

H.E. Ives of Bell laboratories performed an experiment in 1936. He compared the frequency of vibrations of Hydrogen atoms travelling at high velocities with those of resting Hydrogen atoms. To everyone’s surprise, he measured the frequency for the traveling atoms to be reduced as predicted by Einstein’s equation.

What Ives observed was simply a reduction in the vibration of hydrogen atoms. The travelling atom does not know what a second is. It simply knows how to vibrate. If a conscious being is travelling with it without any clock and wants to measure time, he can count the number of its vibrations and when ‘x’ number of vibrations is made, he may ascribe this number equal to one unit of time. If the atom is at rest and the conscious being is again with it, he will again ascribe its ‘x’ number of vibrations as equal to a unit of time. But when he compares the vibrations of the resting atom with that of the travelling atom, he finds that when the resting atom completes ‘x’ number of vibrations, the travelling atom completes less than ‘x’ number of vibrations during that period. Thus he thinks that the travelling atom’s unit of time is yet not completed and concludes that the resting atom’s unit of time is shorter than that of the travelling atom and the travelling atom’s unit of time is longer than that of the resting one, because for him, a unit of time means nothing more than the duration during which the hydrogen atom completes ‘x’ number of vibrations. For this conscious being, a unit of time is a measurement of the duration during which the hydrogen atom completes ‘x’ number of vibrations, or, in other words, it is a measurement of a ‘definite stretch’ of the age of the hydrogen atom as assessed by the number of its vibrations.

So, the frequency of the travelling atom’s vibrations is reduced. If we assume that in its entire life it is destined to vibrate X number of times, its life span will increase according to the clock of the stationary atom. If both atoms are similar in construction in all respects and both have to vibrate X number of times before they decay into something else, the travelling atom will live longer as compared to the resting atom, because its X number of vibrations will long more as compared to the same number of vibrations of the resting atom. The travelling atom’s age will be dilated in comparison to the resting atom. Time is just a measurement of this aging. Aging dilated, time dilated.

Barnett quotes Einstein-

“Since any periodic motion serves to measure time, the human heart, Einstein has pointed out, is also a kind of clock. Hence, according to relativity, the heart-beat of a person travelling with a velocity close to that of light would be relatively slowed, along with his respiration and all other physiological processes. He would not notice this retardation because his watch will be slowed down in the same degree. But judged by a stationary timekeeper he would ‘grow old’ less rapidly.”

Exactly. Beating of heart, as is the vibration of atom, is surely a mechanical phenomenon. It may slow while moving. The traveler may grow old less rapidly while moving- say, he may age less. So he acquires less time as compared to the resting observer and his time is dilated or extended. We should not derive the opposite meaning of this statement that since the time of the traveler is dilated, his age is extended. It is not like that. This view has not been able to tell anything about the nature of time. The same fact considered the other way- since the aging of the traveler
is extended, his time is dilated, because time is just a measurement of that aging- tells us everything about time. Time is not a cause of aging; it is an effect of aging. Time no more remains an enigma if we accept that we acquire time by growing old, not that we require time to grow old and time is just a measurement of this aging. Grow old slowly, acquire less time. Grow old fast, acquire more time. Time is just a measurement of aging of a body- its temporal extension, the fourth dimension- just as length, width and height are measurements of its physical extensions, the three spatial dimensions.

**Muons**

Muons are one of the particles that are produced from nuclei of atoms in the upper atmosphere when bombarded by cosmic rays and they present an exciting case of time dilation. Though most of the other particles decay very promptly and don’t reach the earth, muons are among the ones that safely reach, or even penetrate the ground. This is surprising because after a few millioths of a second, muons mostly decay into electrons. So, even if they travel at the speed of light, they will not be able to travel more than a kilometer in a few millioths of a second and, hence, will be unable to reach the ground level from the upper atmospheric level which is about twenty kilometers high. But they do.6

Naturally, this phenomenon is a good example of time dilation, as is given by many physicists. But this example is in close agreement with my model of time too. Let us see what is actually happening. If not moving at very high speed, the maximum age of muons is not more than a few millionths of a second. But when moving at nearly the speed of light, their age is increased to about few thousandths of a second from our perspective, or, say, they gain more age. Their dilated time is nothing but a measurement of this dilated age. Muons travelling at high speed are aging slowly, hence their life span increases, hence they acquire more time from our perspective. It is not so because since their time is dilated, hence their age is stretched. Rather, it is the other way round- since their age is stretched, hence their time is dilated. Time does not cause aging; rather aging creates time.

Thus, we see that a mere reversal of the relation between time and aging reveals all the secrets of time. *Time is nothing but a measurement of aging.*

**The Curved Space-time**

According to General Theory of Relativity, things don’t fall on earth due to any force exerted on them. Rather, they fall because they follow a curved space-time created by earth. In a nutshell, the theory is stated as ‘mass tells the space-time how to curve and the space-time tells mass how to move’- a two way relationship.

What is this curved space-time? Richard P. Feynman explains- if two objects situated vertically one above the other at a distance of 100 feet follow their world lines7 for 100 seconds, their progress is not the same and their final positions are not simultaneous. “And that’s what we mean when we say that space-time is curved”8, concludes Feynman.

**Time as a measurement of Aging and the curved space-time**

What I derive the meaning from Feynman’s explanation is that at different heights the objects follow their world-lines differently, that is, evolve differently, or age differently, and acquire different amount of time. The higher they are, the more time they acquire.

In fig 1, there are five pairs of identical clocks located vertically one above the other, each pair located at a vertical distance of 100 feet, the lowest pair being on the ground and the highest pair located at a height of 400 feet above the ground. Now the clocks of each pair start moving in opposite directions but in the same direction as the clocks located above or below. Each clock moves for 100 seconds as per its own reading. But according to General Relativity, the clocks near the ground will run slower than the higher ones. The higher they are, the faster they will run. Thus, the clocks near the ground will move longer distance in 100 seconds because they earn their 100 seconds later. The higher ones will move less distance as they earn their 100 seconds earlier. Now, if we join the final destinations all the clocks reach after 100 seconds, we don’t get a rectangle; we get a parabola instead, as shown in the figure. We get a curved space-time.

“In free fall, the trajectory makes the proper time of an object a maximum”

Feynman summarizes the law of motion in a gravitational field-

“An object always moves from one place to another so that a clock carried on it gives a longer time than it would on any other possible trajectory- with, of course, the same starting and finishing conditions. The time measured by a moving clock is often called its ‘proper time’. In free fall, the trajectory makes the proper time of an object a maximum.” 9

Doesn’t it mean that in a free fall the trajectory earns the proper time of an object a maximum? Doesn’t it mean that in a free fall the object tends to acquire a maximum time- a maximum extension in its fourth dimension- rather than stretching any hypothetical invisible time imagined to be flowing in space? Doesn’t it mean that time is an acquirement by, rather than a requirement for its progression in its fourth dimension- its aging? I think it means so.

**Objects age slowly in fields of higher gravitation**

Einstein predicted-

“A clock transported to the sun should run at a slightly slower rhythm than on earth. And a radiating solar atom should emit light of slightly lower frequency than atom of the same element on earth.” 10

In my view, the clock will age slowly at sun than on earth and hence will go slow because it reads nothing but the rate of its own aging phenomenon- its progression in its own fourth dimension. The radiating atom will do everything at a slower rate, thus, will age slowly on sun; hence the light it emits will have a lower frequency too.

The companion of Sirius- a white dwarf having an excessively high density produces a highly strong gravitational field, so strong that the frequency of light emitted by it is significantly reduced. Clearly, everything on this white dwarf is going slow- slow aging, slow emission, low frequency- hence the retarded time.
The frequency of the emission of star is not reduced because the time is slowed there; rather the time is slowed because everything on the star is changing slowly, light is being emitted slowly, hence everything aging slowly, and hence less time is being acquired there. The retardation of time is not the cause of slow emission of light, rather it is the other way round; the slow emission of light, due to slow aging, is the cause of retardation of time. The latter is the effect only.

Time is a measurement of aging of this star, a measurement of its progression in its own fourth dimension. This measurement can be done only by measuring the rate of a phenomenon, a change going on there. If a star is no more growing in its spatial dimensions, the latter can be said to be frozen for it. Similarly, if a dead star is no more aging- that is, no phenomenon is occurring there, no change, no emission of light, no nuclear interactions; it means it is not making any progression in its fourth dimension too, it is not aging, hence it is not acquiring any time; time too can be said to be frozen for it.

Let us turn our attention towards this Feynman’s statement- “Every clock we put at a higher level is seen to go faster. Heart beats go faster, all processes run faster.” 11 Feynman himself contends that this idea is a difficult one to accept: “The idea that time can vary from place to place is a difficult one, but it is the idea that Einstein used, and it is correct- believe it or not.” 12

Why does even a physicist no less than Feynman have to find the idea ‘that time can vary from place to place’ a difficult one to accept? It is simply because of the still dominating idea that time is something present in space, flowing in space- at a constant rate for Newton, at variable rate for Einstein. Of course, the Einstein’s idea is correct; it simply requires a better interpretation.

To me, if at a higher level all the processes go faster- clocks go faster, heart beats go faster; it simply means that these objects age rapidly at a higher level and, thereby, gain more extension in their individual fourth dimension. Thus, they acquire more age, or more time in comparison to those present at the ground level. And, therefore, a device used to measure this gain, this extension in their fourth dimension, gives a bigger reading. The clock located at a higher level reads more time, because it ticks rapidly, ages rapidly and, consequently, acquires more time. It does not mean that there is an invisible time flowing in the sky that is getting faster at a higher level and is thus aiding and abetting some extra time to everything located there which, hence, are getting faster. Clocks on GPS satellites experience about 38 more microseconds per day in orbit than they would on the ground because, as they are aging faster, ticking faster, and acquiring more age, the time they will read will be more. Time read by clocks is simply a measurement of their aging, a measurement of their progression in the fourth dimension. It is just as if a plant planted in open field grows faster than a similar plant planted in a pot; hence measures more height.

A greater height is due to faster growth; not that a faster growth is due to greater height. Similarly, a bigger time reading or a faster time is due to faster aging; not that the faster aging is due to a faster time.

**Time and Distance (Length) are on equal footing**

Let us try to apply our definition of time to General Relativity by another example. Suppose there are two bodies- A and B- identical in all respects and always traveling at equal and uniform speed while on earth. While A is free to leave earth and roam anywhere in space or on any other planet, B is always earth-bound. Each of them is to be provided with only one measuring device- either a measuring rod or a clock of identical construction. Suppose both have opted for the rod. While travelling, they want to measure their movements and time both. They can easily measure their movements- their spatial progressions- with the help of their measuring rods. To measure their temporal progression- the time, they can consider the duration of their spatial progression made as they move by one measuring rod as a unit of time.

As long as both A and B are on the earth, their measurements- both distance and time- agree with one another, as both are moving at equal and uniform speeds. However, now let us suppose A is somehow transported to space where there is no gravity and again trying to make measurements of its movement and time. But it does not know that now it is travelling in a gravity free territory. Its speed increases to some extent compared to that on earth but it cannot notice it, because it counts the period during which it moves by one measuring rod as one unit of time. Suppose it moves by 100 measuring rods and counts 100 units of time. But in the same duration, B on earth moves a bit less, say by 90 measuring rods, so it will count 90 units of time only. B’s 90 units of time are equal to A’s 100 units.

When A returns home and meets earth-bound B, they don’t agree on their measurements of time. They wonder why in the same duration, that is, in between their departure and reunion, their time measurements vary. But they don’t find this disparity too hard to resolve when they come to know that while A could fathom 100 measuring rods during this period, B has completed 90 only. Ultimately they find that their speeds at which they made their spatial progression, which were equal when they were both on earth, vary in relation to each other after they departed. However, until they compare their speeds with one another, they find them unaltered, as both move by 100 measuring rods in 100 units of time. They conclude that after A left earth to roam in space their speeds of movement were different from each other’s perspective. If both of them, after they are depart, count 100 units of time on their own tracks, their finishing moments will not be simultaneous. There is no common time for them. Each of them has its own time, its individual time- the acquired time. It may or may not be equal, depending upon the situation. In this example the bodies measure their time according to their spatial progression. The latter is a part of the aging of the bodies. They can use any other change in their structure or position to measure their aging, and this measurement will serve to tell the time they acquire.

On the contrary, if A and B opt for clocks only, of identical construction, and no measuring rods to do their all measurements, they would certainly try to measure the distances they move with the help of their clocks itself, apart from measuring their times. Suppose they decide that when the clock’s hand completes one round, say one unit of time, they will mark the distance travelled during that period as one unit. As long as both are on earth, their measurements of time and distance agree with one another as both are travelling at the same constant speed. But, after a while, they decide to follow the same old course- B remains on earth but A escapes to heavens, away from the clutches of gravity. B moves on earth till his clock completes 100 units of time, and as such, it counts the distance travelled by it as 100 units. But again, the gravity free space allows the body A and its clock to move a bit faster. When A completes 100 units of time and thereby counts the
distance moved by it as 100 units, its measurements again do not agree with those of B. A finds its distance shorter than that of B.

Time and distance are, therefore, complimentary to each other. If gravity affects one, the other is ought to be affected. If the bodies are acquiring their spatial progressions, they are acquiring their temporal progression too; none is being thrust upon them.

The above example shows that if we accept the definition of time proposed here- “time is a measurement of aging” - neither the propositions of relativity are violated, nor do they appear counter-intuitive.

The above discussion is probably in agreement with Barbour’s statement- “This is the goal I am working towards: time will become a distance through which things have moved. Then we shall truly see time as it flows, because time will be seen for what it is- the change of things.”

He wants to exchange time with distance or change of things. This is what I too have tried to do in the above example - treating time and distance on equal footing.

In the above example, we saw that the measurement of distances (lengths) in space could depend upon time or that of time upon distances. But what is the link that connects time with distance or length? A deeper insight into the matter shows that it is the body, the object that connects distance with time. Both the distance travelled as well as the time acquired is the property of the body, the object. Thus, though as per Einstein and Minkowski, time and space are of course inseparable aspects of the universe, I think, it is the objects which make them inseparable and connect the two. At least time is a property of objects, a measurement of their aging.

“… Objective facts within relativity can seem utterly mysterious and logically impossible if we imagine that time is a river. Such a time does not exist. Relativity makes statements about actual clocks, not time in the abstract.” Barbour also reaches this conclusion while talking about the General Relativity.

Thus, I think that we must keep the spatial and temporal dimensions of objects on equal footing as both are their acquired properties. And I think this is what Relativity has taught us too. But since we have always focused our attention on the dimensionality of space and have considered time too to be the fourth dimension of space- intermingled with the other three, we have not been able to fully exploit the recommendations of Relativity.

*If we shift our attention from the dimensionality of space to the dimensionality of objects- which in my view is the real dimensionality- the recommendations of relativity might get fully appreciated, and time might reveal its real nature to us. Time is an acquisition (effect) of aging; not a requirement (cause) of aging. Time is the fourth dimension of objects.*

**REFERENCES**


**AUTHORS**

**First Author** – Dayalanand Roy, Associate Professor, Department of Zoology, SMM Town PG College, Ballia, U.P. INDIA, 277001, E Mail : dayala@rediffmail.com
Fig. 1: The curved space-time.