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On Psychological Comprehension of the Physical Time and the Cosmos

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Abstract: ***We live in a strange but wonderful Universe. It requires extraordinary imagination to describe and appreciate its age, size, violence and beauty. We increased our understanding about the behavior of our universe remarkably from Aristotle' Universe to Hawking's Universe through rigorous up gradation with Newton's Universe and Einstein's Universe. But why should we think that we know better now? The ambiguity of space and the physical time made us modest to accept that we uncovered some stones of a mountain of knowledge. There lies a paradise of knowledge to be still extracted. We live in peace because the destructive, devastating atoms behave gently after composition to form gentle compound. So, the composition of destructive atoms completely changed their original behavior to behave so gently that we can boldly and safely say water is life even if it is made up of hydrogen which is responsible to raise the temperature of sun to billions of degrees at the core. Even water is pleasant for us, but when left alone hydrogen, one ounce is enough to destroy Hiroshima. The same reflect in psychological behavior, the composition as a society made us to abandon the original wild behavior and force us to be gentle almost all the time. We exist because of stable and gentle behavior of wild and unstable atoms. Everything is so fine-tuned and balanced that we can resemble the universe or our cosmos is on the knife edge. We have born with disability to anticipate future which is also the cause and purpose of life, which can be termed as the causality, then, how far we can go; only the time will tell. Unless we do remarkable progress in science and technology, we have to live in the same place in a dark, dull, cold, boring Universe with background radiation that can raise 2.7 degree centigrade above absolute zero (- 273 degree centigrade).***

Keywords: The physical time, Absolute zero, Hawking's Universe. Atoms and Compounds, The Background Radiation.

1. Introduction

The ancient people tried very hard to understand the Universe without proper mathematical tools and rigorous computational capability [1, 2]. They even made towers to look into the sky undisturbed and more closely [3, 4]. Today we have many very powerful tools like advanced mathematics, computers and telescopes [5]. With the help of these tools, modern scientists have gathered key knowledge of space, the physical time and the universe or the cosmos. The first noticeable work in mathematics was Euclid's works in his one and only survival book "The elements" which is the best seller of all time after the Bible [6 -9]. With the possible exception of Sir Isaac Newton, Euclid is known as best mathematician of all time [10]. Although it is also rumored that, he was mere an accumulator or compiler of ancient Greek works on mathematics [11]. But his work is accepted as the best single handed work in mathematics. So is the name goes with Sir Isaac Newton as most noticeable single handed work in physics [12, 13]. The quest that started with noticeably from Aristotle to all the way to Hawking's radiation via rigorous development of Sir Isaac Newton and Albert Einstein which reveals that we humans hold a place within the vast cosmos which is pretty insignificant [14, 15]. So, we try to make sense of everything to see how we fit in [16]. And yet we have now enough knowledge about the cosmos to ask further questions like what do we really know about the cosmos [17]? Where did the cosmos come from? Where is it going towards [18]? Did the cosmos have a beginning and if so, what happened before that? What are the basic concepts and properties of the physical time [19]? Is it an ever rolling stream or will it come to an end? Can we be able to go back in time, i.e. is it possible, time runs reverse? Recent breakthroughs in physics and astronomy accumulated some clues of these long standing quests. Someday these questions might be as obvious as the Earth is of oval shape or the Earth rounds the sun in an elliptical orbit [20]. Whatever may be, only time will tell us.

2. On The Relativity

Is it correct that light speed is 1, 86,000 miles per second, or 3, 00,000 kilometers per second? Photon has no intrinsic mass i.e. it is massless, at least based on particle detector, although nothing is massless [21, 22], but still we can assume that it is pure energy, so it propagates through [23, 24]. Because it travels as wave, it never travels in a straight line. Rather it travels as other waves like electromagnetic radiation or background radiation. And waves have crest and through. But we measure light speed as the straight distance travelled by the light to the time taken to travel the distance. As light propagates in a curly path, it travels more than a straight distance. So, the actual velocity of light is more than the measured velocity i.e. 1, 86,000 miles per second, or 3, 00,000 kilometers per second. Then, todays measured light speed cannot be Universal speed limit of the Universe. Roughly, the curved distance (assuming light wave is a pure sin wave) is at least slightly more than 1.15 of straight distance which yields that the minimum speed of light is 1.15 X 3, 00, 000 kilometers/second =3, 45,000 kilometers/ second or 1.15 X 1,86,000 miles per second = 2, 13, 900 miles per second. Travelling of light as wave indicates that space is not flat at all and massless (or particle with minimum mass possible) photon respond with maximum deviation possible from being straight in a curly space, in other words, light just use the curliness of space to travel through. The deviation decreases proportionally as the mass of an object increases. That is why, the deviation is hardly noticeable for the motion of earth, but still it travels like a wave with very minimum deviation possible from being straight in a curly space. Energy is nothing but particle with minimum mass possible. Ordinary particle is particle with minimum energy possible. The equivalent way is, Ordinary

particle can be termed as energy with maximum mass possible in it and energy is something that has maximum energy with minimum mass possible in it. Thus, as energy propagates, particle also propagates. In other words, everything propagates, does not matter, it is energy or particle. Thus energy and particle are just flipped sides of the same coin. There are natural processes to convert energy into mass and vice versa by obeying Einstein's famous equation-

$$E = mc^2 \quad (1)$$

Thus ordinary particle with maximum mass becomes energy with minimum mass and vice versa. The Universe is a natural oven for mass-energy conversion process which is an uphill task for human being. The minimum energy content of ordinary mass acts as gravity of the mass. Every particle has its individual gravity but massive mass like Earth has strong gravity as it is huge collection of particles – each particle's gravity adds to form strong gravitational field of a massive mass. As ordinary particle like atom tries to have bond with other particles, similarly, the gravity attracts other gravitational force to establish bond of gravitation, the reason why gravity is attractive. But a particle's gravity is attractive to another particle's gravity only and a particle's gravity is repulsive to anti-gravity of anti-particle. This is the reason why the anti-particle's universe is excluded from the particle's universe we live in. That is the reason why we never annihilate with our anti-self; our universe is totally protected from the anti-universe because of the repulsive force between universe and its counterpart the anti-universe. Even if particle and anti-particle pair are produced, they stay detached for very short period of time before annihilate again- the reason there is constant fluctuation of energy in empty space because of momentary production of particle and anti-particle pair and then, annihilation again. So, anti-particles are very volatile in our universe, highly unlikely to find some of them in our cosmos. Similarly, it is very hard to find particle in anti-universe, if found some will be for very short period of time before annihilation. The question is how photon is responsible to abandon the Universal time. Do we know really the time? Or we know psychological interaction with time? Observers are mere psychologically dependent reality. Clock is a psychological measurement of time only. Time interact with gravity because both are energy form of particles. Then if gravity is universal, why not time? Time runs at the same speed everywhere. But gravity makes time more curved as curved-space does to photon and its motion looks like wave propagation, and thus it looks like time runs slow under the influence of gravity as due to more curvature movement which is directly proportional to gravity, and thus time travels less straight distance, so is psychologically slowdown of time. Psychologically as we understand straight space and time, we use terms propagation in space movement and time dilation in temporal movement under the influence of gravity. So, time runs forward slowly under the influence of gravity. Gravity is proportional to the time's path deviation from being straight. If gravity is such that the time deviation is curved enough to form a closed loop so that, psychologically, it is as if time stopped running either direction - forward or backward. Psychologically, time has no meaning there, where time formed a closed loop - it is as if time is going nowhere, no beginning and no end either as closed loop cannot have edges. To get a psychological meaning of time, it has to run either forward or backward direction. For us, time runs forward, the psychological interaction with time is called present. Actually, nothing is present, or it is rather an illusion to be at present. But this interaction made our past, the way it is and the interaction is unfolding our future to store as past. Thus psychological present is an abstract idea, psychological past is a psychologically clear unfolded idea, and future is actually a no-idea. If present is psychologically interacting, past is psychologically already interacted, and future is yet to interact with. Psychological limitation is that the event lies in a no-idea range before interaction with psychology. Unfolding future being in future is never possible before is it unfolded by present. It is because time psychologically never interacts with future at present state. The interaction with time made us believe that we can control time, but as past and future cannot be alterable, so is present. Although, it is pessimistic conclusion but it is the real truth of time.

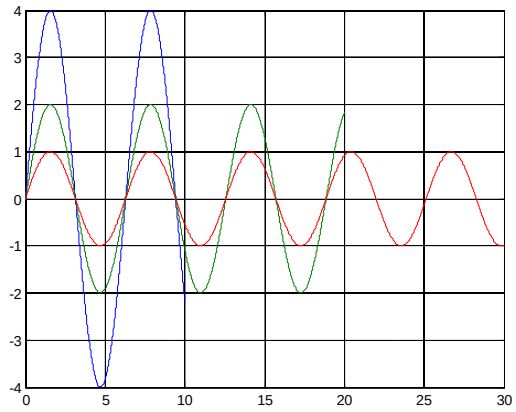

Figure: The comparison of temporal movement with and without the influence of gravity

The wave in red indicates that the temporal movement without the influence of gravity, the natural response of an energy in a curly space, very similar to the response (wave propagation) of photon in a curly space. The wave in green is under the influence of gravity, although time travelled the same distance as the wave in red, but because gravity made the time more curved, its forward movement slowed down, which is time dilation psychologically, in other words, time runs slow under the influence of gravity. The wave in blue is temporal movement under very strong gravity which made the time more curly, as time travelled the same distance as the wave in red, a more curvature made further slowdown of time in forward direction. Based on psychological recognition of time, it is as if time slowed down further under the influence of strong gravitational force. As gravity increases, the time becomes more and more curved. If a certain limit of gravity is crossed, time becomes curved enough to form a close loop, which is no meaning of time psychologically. For example, time has no meaning psychologically in the black holes because time is curved enough to form a closed loop which is outside of the scope of comprehension psychologically. And that does not mean time is dead, but for ourselves it is as if time is dead for us. Time caught trapped in the black holes. To be released from the black holes, it needs black holes to be evaporated which will take at least 10^{28} years for complete evaporation in Hawking's radiation to release energy.

3. On the Newton's Gravity

The gravitational field of an object is never uniform in its gravitational range i.e. there is nothing called uniform gravitational field. The gravitational field is strongest on the surface of the object and inversely proportional to the straight distance from the surface. A good example can be a decaying exponential. The acceleration of an object in a strong gravitational field is nothing but the result of stronger field towards the surface. The free falling object accelerates to respond to the continuous stronger and stronger gravitational field. The apple on the Newton's head would have fallen in a uniform speed if the gravity would be uniform. But uniform gravity is an illusion idea. It is never in practice. If an object set free in a strong gravitational field, it feels very next point towards the surface a stronger field and that put it in motion. At the very next point, a stronger field made velocity to increase. So, the velocity is growing until it hits the ground. The object responds to the ununiformed field only with ununiformed velocity. Psychologically, we observe it as acceleration. The same reason is why the object decelerates when it is thrown against the gravitational field- in that, object is moving from stronger gravitational field to weaker gravitational field, to respond to the weak one, it just slowed down. A continuously weaker gravitational field away from the surface makes the thrown object to decelerate continuously. So, acceleration is psychological interpretation of the response to the stronger and stronger gravitational field. And the reverse (deceleration) is also true in opposite direction.

4. Conclusion

There are many interpretations of the happenings of the cosmos, so are there different models of the Universe starting from Aristotle's Universe to Hawking's Universe via Newton's universe and Einstein's Universe. Sometime these models aid each other, and sometime it contradicts each other, the contradiction is as if both cannot be true at the same time. The first noticeable model, although it was proved wrong later, was made by Aristotle, who believed that Earth was at the center of the Cosmos, and all planets (the wanderers in the sky) and stars are moving around the Earth in the Cosmos. The best single handed work in physics was proposed by Sir Isaac Newton at 1687 published his Philosophiae Naturalis Principia Mathematica. It is probably the most influential single handed work in the Physical Science that gave new dimensions in understanding the Universe or the cosmos. The Newtonian physics not only showed us a theory of how bodies move in space and time, but he also developed the complicated mathematics necessary to analyze those motions, in his model, time was universal and he believed of a static universe. If gravity is universal property, so is it, the physical time. The slowdown of time under the gravity cannot make it relative, so is a light ray cannot make time relative either. But certainly a light ray can alter the psychological measurement of time for sure. Time is a universal property like the gravity, they interact each other as they are both energy, but by no means it can be concluded that time is observer dependent reality.

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