

On Our Psychological Picture of the Universe – The Unification of Physics Supports the Physical Theory of Determinism

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Abstract: *We are used to the thoughts that everything has a beginning and an end. We are trained by the surroundings of the world to have beginning-end theory always in the back of our mind. Everything we observe around us has a beginning and an end. All living beings have a beginning and an end. All non-living things of the world also fall into the same category. The beginning-end theory gives us psychological comfort that we are trained to be used to. The theory of general relativity is called low energy theory – because its predictions are fairly accurate in low energy conditions only. So, it can be regarded as a good tool for partial theories which are sufficient to make accurate predictions in all but the most extreme situations. The same thing applies to the quantum mechanics and the Newton's classical theory of gravity. A completely separate identity is necessary before a beginning of anything. For example, every two people are not identical. Everybody has one and unique identity. Thus, everybody has a unique and separate beginning. Everybody has a beginning to perform specific tasks that are unique. A combination of many atoms that are combined to perform specific tasks throughout like respiration can be called intelligent life. Because, intelligent life has one and unique identity, thus, it has a unique beginning. Beginning is a relative word, but if anything that has beginning, it must have an end, that is, the combination of many atoms that are doing specific tasks like respiration, is no more valid. The end is also a relative word. We extend the day to day experience of beginning-end theory with the help of our psychological imagination that the Universe must have a beginning (probably the Big Bang) and it must have an end (possibly the Big crunch). If somehow we can conclude that the Universe has a beginning and an end that resemble our day to day experiences including our life, we are happy enough with the conclusion. It is as if we started our journey of about investigating the Universe with psychologically predefined conclusion that matches with the beginning-end theory. All physical theories are partial theories because they are valid only on limited observations in the limited or restricted part of the Universe. Then the ultimate unified theory of physics must be predicting everything accurately under all conditions which infers that the ultimate unified theory of physics must also be predicting our future deeds accurately. Thus the theory of determinism must be included at least if not a leading role in the formulation and quest of the ultimate unified theory of physics of the Universe.*

Keyword: The ultimate unified theory of the Universe, The theory of determinism, The Big Bang and the Big Crunch, the beginning-end theory, The theory of general relativity and quantum mechanics.

1. Introduction

In order to describe the Universe with the beginning-end theory, we need to understand what actually a scientific theory is [1]. A simpleminded view of a theory is that it is just a model of the Universe or a limited or restricted part of it [2] and a set of rules that relates the variables of the model with one another [3]. The theory only exists in our mind and it does not have any other reality [4]. It is just a model based realism that relates quantities in the model to the observational facts that we make [5]. A good theory must cover a large class of observations and it must contain very few arbitrary numbers in it which can predict future results fairly accurately [6]. For example, Aristotle's theory describes that everything is made of four fundamental elements – earth, air, fire and water [7]. It is a simple enough theory to qualify, but it does not predict any futuristic result [8]. On the other hand, the Newton's classical theory of gravity is even simpler that bodies attract each other with a force that is proportional to their masses and inversely proportional to the square of the distance between them and yet it predicts the motions of the planets of the solar system and Sun and Moon fairly accurately [9].

$$F = G \frac{m_1 m_2}{d^2} \quad (1)$$

Where m_1 and m_2 are masses of the two body
 d is the distance between the bodies.

F is the Gravitation force of attraction between the two bodies.

G is the gravitational constant ($6.674 \times 10^{-11} \text{ N} \cdot (\text{m}/\text{kg})^2$)

Einstein's theory predicted slightly different motions of the planets of the solar system than the Newton's theory with better accuracy which indicates confirmation of new theory [10, 11]. But we still prefer to use Newton's theory on motions of planets of solar system as the difference between the predictions of the two theories very marginal and the great advantage of Newton's theory is that its simplicity compared to the Einstein's theory which is very complex [12]. Well, any theory is very provisional [13], in that sense, it is kind of a hypothesis – you can never prove it [14, 15]. No matter how many times the results agree with observations, you are not sure that next time it will not contradict with a new observation [16]. On the other hand, you can disprove any theory with one observational fact that falsifies it [17]. As long as observations confirm a theory, it survives [18] and confidence is increased but any new observation that falsifies it, you have to either abandon the theory or it needs modifications to agree with the new observational facts.

2. The Physical Theory of Determinism

If past is one and unique, then it is true with the future also.
If past can be explained in one and unique way, then so is

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the future that can also be explained in one and unique way. Psychologically our brain can interact with past only, not with the future [19, 20]. Thus, it is making the future psychologically probabilistic for us [21, 22]. On psychological point of view, it is definite past and uncertain future [23, 24]. But future is anti-past and the past is anti-future. For example, a subtraction is also a negative addition [25]. If addition gives us certain result, then it is true with subtraction also [26]. The same rule applies to the past and the future also. Everything has a fixed tenure of existence in time which we call life.

$$\text{The Future} = \text{The Life} - \text{The Past} \quad (2)$$

Because both the life and the past are definite, so it is true with the future too. A brave attempt on the theory of determinism was proposed by Pierre-Simon, marquis de Laplace. According to Laplace, given the initial conditions of the system (the states of the system), future can be completely determined [27]. Given the outputs of the system, if the states of the system can be completely specified, then the system is called an observable system. Given the states or initial conditions of the system, if inputs or excitations can be completely specified, then the system is called a controllable system. The progress of the study of the Universe is that till date the Universe is neither controllable nor observable by us.

3. How The Physical Theory of Determinism Relates to the Unification of Physics

In modern days, scientists describe the expanding Universe with two partial theories – the general theory of relativity and quantum mechanics which are regarded as great intellectual achievements of the first half of the twentieth century. The general theory of relativity describes the force of gravitational attraction and the large scale almost uniform structure of the expanding Universe from a few miles to a million million million million (10^{24} miles) miles, the size of the observable Universe. On the other hand, the quantum mechanics deals with the phenomenon on extremely small scales such as a millionth of a millionth of an inch. Unfortunately both the partial theories contradict with each other – cannot be both correct at the same time. To make both consistent with each other, attempts are made to unify both the partial theories to develop quantum theory of gravity. This is not yet developed but it can certainly be part of the unification of physics. The theory of relativity, the Newton's gravity and quantum mechanics are all partial theories as they support all but most extreme situations where they broke down [28]. The ultimate unified theory of physics must be such that it can predict future under all conditions accurately. So, according to the ultimate unified theory of physics, the futurity is predefined and preordained which implies the theory of determinism implicitly. Thus, the theory of determinism must be at least a part of the unification of physics if not have a leading role to formulate.

4. Conclusion

A particle has an anti-particle. Future has anti-future (past) and the past has anti-past (future). History and futurity are

the flip sides of the same coin. Past is just a negative future and future is just a negative past. We can train our past to calculate future as we born with the disability that we cannot interact with the future directly. The past can enlighten us to the future. But certainly the photon is not responsible for the time the way it is which is predicted by the theory of relativity. Suppose the whole Universe become completely dark and no single photon is available to enlighten us, still we can pass another five days or more than 100 hours before the human race is completely wiped out by the fall of temperature due to lack of heat energy. So, we will pass time even if single photon will not be available. The time's interaction with the psychology is the key to make a psychologically uncertain future into an actually definite future. The time's interaction with the psychology can give us clues to enlighten the future. After all, what is happening, that is the only way it can happen- the physical theory of determinism.

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