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MULTIVERSE AND PANENTHEISM

Man Ho Chan*

The Education University of Hong Kong, Department of Science and Environmental Studies, Tai Po, Hong Kong, China

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Abstract

Current theories of Physics and Cosmology suggest that the fundamental constants and conditions of our Universe are fine-tuned for the existence of life. Apart from the theistic argument, many scientists believe that the fine-tuning phenomena in our Universe indicate that we are living in a multiverse that consists of a large number of universes. In this study, I discuss the likelihood between the ideas of multiverse and panentheism. If we are living in a multiverse and God exists, based on three arguments, I show that God is likely to be panentheistic. This provides the first theological discussion connecting the ideas of multiverse and panentheism.

Keywords: multiverse, panentheism, fine-tuning

1. Introduction

For several decades, it has been known that our Universe is fine-tuned for life to exist. The ranges of the values of the fundamental constants and conditions that allow life to evolve are extremely narrow [1]. For example, if the strength of the nuclear strong force is changed by 20%, life cannot exist [2]. Nevertheless, all of the fundamental constants and conditions, surprisingly, fall into these narrow anthropic ranges for the evolution of life. For life to exist, many fine-tuned conditions need to be found for intelligent life - human beings - to evolve and exist [2, 3].

Fine-tuning phenomena have drawn a great deal of attention from scientists, philosophers and theologians. From the perspective of religious studies, the fine-tuning of our Universe indicates that God exists [4, 5] as God is believed to have fine-tuned the constants and conditions that allow life to exist. This is known as the fine-tuning or design argument [6]. Conversely, some scientists believe that the fine-tuned constants and conditions might indicate that our Universe is not the only universe [7, 8]. We are likely living in a multiverse, which consists of a large number of universes. If every universe has a unique set of fundamental constants and conditions, it is probable that there exist some universes that contain comparable anthropic constants and conditions for life to evolve. Therefore, the observed fine-tuned universe is a selection effect at all.

*E-mail: chanmh@eduhk.hk

It seems that the design argument and the multiverse argument are effectively two competing theories to account for the fine-tuning phenomena [9]. The former argument is a theistic argument while the latter is naturalistic. Nevertheless, these two theories are not necessarily in competition and are mutually exclusive. A recent study has demonstrated that certain versions of theistic multiverse theories might make it possible to argue for the existence of both God and the multiverse [10]. Therefore, from the perspective of theological studies, one should not dismiss the possibility that God has created a multiverse [10-12].

Indeed, one can deduce some intrinsic connections between theological models and the idea of the multiverse. For example, Chan has shown that God in the guise of classical theism (omnipotent, omniscient and perfectly good) would be less likely to create a multiverse [13]. This is because creating a multiverse would generate many useless and bad universes which violates the acts of a perfect God. Although this claim is controversial, it provides a possible connection associating the nature of God with the physical nature of our world (single universe vs. multiverse). In this study, I will discuss another possible connection between the nature of God and the multiverse. I argue that if we are living in a multiverse and God exists, God is likely to be panentheistic.

2. Properties of panentheism and the multiverse

Simply put, the term 'panentheism' means 'all in God', which refers to the doctrine that our world exists within a divine being [14]. Nevertheless, in terms of panentheism, different scholars might have different definitions, emphases and descriptions. For example, Griffin understands panentheism as a model of God-world interaction, wherein God can influence but not determine the world [15]. Peacocke described panentheism as God continuously creates through the processes of the natural order [16]. Unlike classical theism, God's Creation is not an external influence upon events. Philip Clayton believes that our world is panentheistic, which affirms the interdependence of God and the world [17]. God's internal presence provides the order and regularity that the world manifests.

Based on the aforementioned general descriptions, panentheism can be summarised by the following three properties taken to describe the nature of God [18, 19].

1. God is both transcendent and immanent in the world.
2. God and the world are interdependent and bilaterally related.
3. God creates and acts through the natural laws.

In summary, the idea of panentheism suggests that God contains the world, yet is also more than the world (i.e. property 1) [19]. Besides, God and the world have a mutual relationship. The world not only derives its existence from God but also returns to God (i.e. bilaterally related, see [19]). Furthermore, all of the God's creations are done via natural processes.

If our God is panentheistic, can we find any signs that are closely related to panentheism? Some argue that an absence of any special events of Creation in our Universe could be a possible sign of panentheism. For example, the theory of biological evolution and the Big Bang theory suggest that life and our universe naturally evolved [16, 20]. In the following sections, I will discuss the potential connection between panentheism and the idea of multiverse. This might be another possible sign of panentheism.

Recent theories of the multiverse mainly originate from string theory. String theory states that a particular set of fundamental constants is determined by the Calabi-Yau manifold [21]. Some models predict that there are 10^{500} possible types of the Calabi-Yau manifold so that, other things being equal, there are 10^{500} different possible universes [22]. Together with the eternal inflation model, different universes with different fundamental constants can be randomly generated by stochastic quantum processes, just like particles randomly created via quantum fluctuations. This is the most popular model of the multiverse. Notably, the idea of the multiverse is not entirely new. Various versions of the multiverse have been suggested in the past centuries [23], and Tegmark [24] has summarised possible multiverse proposals into four different levels. However, we will not focus on any technical details of these multiverse proposals. We will solely rely on the very basic definition of the multiverse - a set of many different co-existing universes.

Although some studies suggest that the multiverse cannot be falsified or verified [25], some probabilistic arguments show that we are living in a multiverse. For example, Carroll argues that the small value of the cosmological constant suggests that there are probably many universes [8]. Moreover, the void exists in front of the cosmic microwave background cold spot and the movement of more than 1000 galaxy clusters might indicate the gravitational pull from other universes [26]. These arguments are not direct proof of the multiverse and they are somewhat controversial. Nevertheless, in principle, it may be possible for us to investigate whether the existence of the multiverse is likely or not.

In the following section, I argue that three aspects show a strong connection between the ideas of multiverse and panentheism (i.e. P(panentheism|multiverse) is high), which means that if we can show that the multiverse exists, the divine nature is likely panentheistic.

2.1. Creating universes via natural processes

Based on the idea of the multiverse, those universes with anthropic fundamental constants can generate life and even intelligent life. Therefore, not all universes would generate life. This is a selection process like biological evolution. Peacocke believes that the process of biological evolution somewhat supports panentheism because our world is a unity composed of complex systems in a hierarchy of different levels. Life immanently evolves in the world rather than being external to the world [16]. God creates life through the processes of the natural order. For the multiverse theory, similarly, the properties

of the universes generated depend on fundamental constants and their physical properties. Some universes might generate order while others might generate nothing. The multiverse as a unity is composed of a hierarchy of different possible levels of order and structure. This matches what Peacocke describes in our world as panentheistic.

Moreover, God's Creation is constrained by the fundamental physical properties of the universes. In other words, the universes generated would have 'freedom' not to create structures or life, and the 'freedom' is determined by the fundamental properties of the universes. Strictly speaking, God cannot control what a universe would create, for the fundamental properties of the universes are randomly generated. Therefore, in contrast to the position of classical theism, God cannot create what He wants in a particular universe. Theoretically, no life could evolve if all the universes in the multiverse do not have the anthropic fundamental constants. God's creation is constrained by the multiverse properties. Moreover, God's creation is inside the multiverse rather than external to the multiverse. Therefore, God's creation via the multiverse demonstrates some of the major properties of panentheism.

2.2. Creation not from absolute nothingness

Classical theism usually claims that our universe was brought into existence *ex nihilo*, and this is because classical theism takes the view that God is omnipotent and He can create everything out of nothingness. However, for the multiverse, the ultimate world is eternal and different universes are generated from chaotic eternal inflation. The theories of the multiverse can satisfactorily avoid the singularity problem of our Universe. Aguirre shows that no beginning or initial state is needed for the multiverse [27]. All the universes would simply exist eternally. In other words, the beginning of our Universe is not a true beginning. Therefore, the idea of *ex nihilo* is not necessary in the idea of the multiverse, unless the whole multiverse is not eternal [28].

From this perspective, the Creation process within the multiverse framework is one of transforming our world from chaos to order. This is similar to the idea proposed by Griffin that our world was created out of relative nothingness based on panentheism [14, p. 24]. The relative nothingness was a chaos of momentary events [14, p. 25], and during the chaotic eternal inflation, different universes are generated and the primordial freedom embedded (e.g. different fundamental constants) would manifest the creativity to evolve structures or life. Therefore, strictly speaking, the whole process of creation is not solely for human beings. This is again consistent with the ideas of panentheism [14, p. 84].

2.3. Manifesting and understanding the greatness of God

The multiverse involves an extremely large set of universes. Although the total number of universes is uncertain, the current estimations can range from

10^{500} to $10^{10^{10^7}}$ universes [29]. These are huge numbers beyond our experience. According to panentheism, God is immanent in the multiverse. The greatness of the multiverse can, therefore, fully reflect the greatness of God. As pointed out by Collins, "since […] God is considered infinite and infinitely creative, it makes sense that Creation would reflect these attributes, and hence that physical reality might be much larger than one universe" [11, p. 460]. In other words, the multiverse is inevitable because our God is too great and immanent in our natural world. Such a large number of universes or entities do not pose a problem to our understanding of countable infinity or uncountable infinity [18].

However, as mentioned by Chan, creating the multiverse would likely generate many wasted, purposeless or even very bad universes, unless the multiverse He created is fine-tuned [13]. As a classical theistic God, an omnipotent and perfectly good God would be less likely to create a multiverse. He would, rather, choose to create a single universe to achieve His goals [13]. Therefore, some tension might exist between the concept of the multiverse and classical theism.

Nevertheless, if our God is panentheistic, this would not generate any problem because our God is constrained by the laws of Nature. Although only a few meaningful universes may have resulted, this is the only way God would create. Therefore, the multiverse and panentheism are likely to be a unified framework. The greatness of the multiverse manifests the greatness of the panentheistic God directly, without facing any problem in classical theism.

Moreover, when intelligent life has evolved in some of the universes, it (e.g. human beings) can develop Science and Philosophy to understand our Universe and the multiverse, and interactions between intelligent life and God/the Universe can be facilitated. Therefore, the intelligibility of the universes and the multiverse might be an intrinsic property of the multiverse. Thus, the multiverse would establish a bilateral relationship between the creatures and God, which is another key property of panentheism. We need not be amazed that our universe is comprehensible and intelligible. This might be determined by the panentheistic multiverse already.

3. Discussion

In this study, I discuss the possible connections between the idea of multiverse and panentheism. Although various previous studies have reviewed and discussed whether our world is panentheistic, this is the first time we explicitly discuss the association between the multiverse and panentheism. Indeed, we have no solid evidence to indicate that we are living in a multiverse. Moreover, some philosophers and scientists reject the very idea of the multiverse as it might violate the principle of simplicity or falsifiability [4, p. 118-120; 5, p. 59-60; 25]. Nevertheless, many physicists and string theorists do support the idea of the multiverse [8]. In any case, no concrete conclusion can be drawn so far among scientists and philosophers [30]. In general, we should not omit this possibility, and we have shown that there are some conceptual connections

between the multiverse and panentheism. This study can provide a possible new theological model contributing to the dialogue between Science and Theology.

I have proposed three arguments that there is a strong connection between the multiverse and panentheism. This suggests that the idea of the multiverse does not necessarily refute the theistic argument [10]. In other words, if one day we can prove that we are living in a multiverse, it would not undermine the belief in the existence of God. Instead, this might indirectly increase belief in the panentheistic model. Therefore, the relationship between the multiverse and the existence of God is dependent on a theological model.

Note that I did not argue that panentheism is the correct model of theism, nor it is better than the traditional classical theism. Indeed, panentheism has to face some intrinsic problems of how God and the world metaphysically interact with each other [31]. Here, we did not discuss how God interacts with the world and the way of providence originating from God. These issues are closely related to panentheism but are not in the scope of this study. We only focus on the fine-tuning phenomena within the multiverse framework. How God has guided the evolution and structure formations in our universe is not our major concern in this work. Nevertheless, this study can facilitate the traditional theological discussion of the multiverse proposed over the past centuries [23, p. 106-141] and provide a new possible connection relating to the idea of the multiverse and panentheism.

4. Conclusion

To conclude, based on the three arguments presented in this article, I argue that if we are living in a multiverse and God exists, God is likely to be panentheistic. This provides a new possible connection relating to the idea of the multiverse and panentheism.

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