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Deducing the Universe's Origin Using Occam's Razor

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Review Article

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ABSTRACT

We may never be able to definitively answer the question of the universe's genesis and future. Despite the fact that there are numerous hypotheses circulating around. This study offers a more grounded approach by going back to the basics, looking at what we already know, and deducing the universe's origin and future using a combination of logic and Occam's razor. The law of conservation of energy can be breached, according to this research, because this universe began as a black hole in another universe. It will also speculate on a hypothetical method for black holes to undergo a 'Big Bang,' as well as a possible process involving black holes and Hawking Radiation to create energy from nothing.

INTRODUCTION

The origin of the universe has always been and will continue to be a source of discussion, which we may never be able to settle definitively. As a result, a variety of hypotheses have been proposed to address this issue, ranging from credible to radically speculative. This paper will attempt to address this question in a plainer, grounded manner by going back to fundamentals, looking at what we currently know, and using a combination of logic and Occam's razor to deduce the universe's origin [1].

Many times in science, logic and deduction have been utilized to successfully postulate mechanisms and results to diverse issues. In answer to the difficulty of beta decay not seeming to conserve energy, momentum, and angular momentum, Wolfgang Pauli proposed the presence of an undiscovered particle we now know as the neutrino. This kind of 'cold' reasoning and out of the box thinking comes in handy when trying to answer an apparently open-ended issue like the one posed in the title of this paper.

Occam's razor is a theory-building or evaluation principle that states that, other things being equal, explanations that posit fewer entities, or fewer types of entities, are preferable to explanations that posit more. It's commonly misunderstood as a general advice for simpler explanations over those that are more complex. It is a heuristic, or "rule of thumb," that scientists employ to help them create theoretical models. When deciding between two hypotheses, the phrase "razor" alludes to the "shaving away" of unneeded assumptions. Occam's razor is used in biology to assess evolutionary change and in medicine to diagnose among many other scientific applications [2].

While Occam's razor is a useful tool, it has also been known to stymie scientific advancement. It was once used to accept oversimplified (and initially wrong) explanations for meteorites, ball lightning, continental drift, atomic theory, and DNA as a genetic information carrier. However, as more research was conducted and more evidence was uncovered, other theories based on the new data arose.

Occam's razor does not always follow the simplest hypothesis, whether it is correct or incorrect; it is not an example of simplicity for the sake of simplicity. It simply tries to cut through the noise to discover the best theory based on the most up-to-date scientific concepts and expertise [3].

LITERATURE REVIEW

This paper will attempt to deduce the universe's genesis and future using logic, reason, and Occam's razor. Of course, there will be assumptions and guesswork, but they will be well-founded and reasonable enough to keep this paper rational.

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The initial assumption is that the cosmos was not created by a God or any type of magic. For the sake of this argument, we will suppose that the principles of science can adequately explain the origins of the cosmos.

Furthermore, this document will not accept 'arguments' that are unable to completely explain themselves. Some theories claim, for example, that the cosmos's energy and matter have "always existed" or that the universe "simply happened." These assertions appear to put the argument to a close on the surface, yet they completely evade discussing the subject at hand [4].

The third assumption of this paper follows logically from the first two: that there had to be a universe before this one, and that there will be one after it. In short, in the larger scheme of things, there is a cycle of universes stuff. This derives from the fact that this universe exists, and we know that it had a beginning what we refer to as the big bang. As we have previously ruled out the explanations of magic and it just occurred, this universe had to come from somewhere. Although several theories exist, the most basic answer for where this somewhere is a universe that existed before ours. Following this logic, our world should be able to 'birth' another universe in order to keep the 'cycle of universes' going.

Evidence for the beginning of our universe leads to an explosion known as the big bang, which hurled vast amounts of energy into the void of space. To put it another way, the big bang was simply an incredibly concentrated mass of energy that 'detonated' to create the universe. Furthermore, it is widely assumed that this incredibly concentrated amount of energy emerged from a solitary point, or singularity, as we would call it.

Prior to the twentieth century, it was widely assumed that nature was simple and that simpler beliefs about nature were therefore more likely to be correct. This idea was based on the aesthetic value of simplicity in human intellect, and explanations for it were frequently drawn from theology. In the 13th century, Thomas Aquinas offered the following argument: If a thing can be done effectively by one, it is useless to perform it by numerous; for we note that nature does not employ two instruments. The statement of Occam's razor that "other things being equal, simpler explanations are often preferable than more complex ones" is empirically testable [5]. "Simpler hypotheses are often better than complicated hypotheses," as another interpretation of the razor's phrase goes. To test the former interpretation, the approach would compare the performance of basic and more elaborate explanations. If the first interpretation is accepted, the validity of Occam's razor as a tool must be questioned if more complicated explanations are more often correct than less complex explanations.

Even if certain complexity increases are sometimes required, there is still a legitimate preference for the simpler of two competing explanations. Consider the fact that there are an infinite number of potential, more sophisticated, and ultimately erroneous alternatives for each accepted explanation of a phenomenon. This is because an ad hoc hypothesis can always be added to a poor explanation. Ad hoc hypotheses are arguments for theories that prevent them from being disproved. Basic probability theory provides one rationale for Occam's razor. All assumptions, by definition, add the possibility of inaccuracy; if an assumption does not improve the accuracy of a theory, its only function is to increase the likelihood that the entire theory is incorrect [6].

According to Karl Popper, a desire for simple theories does not have to be motivated by practical or aesthetic concerns. The falsifiability criterion may justify our preference for simplicity: we prefer simpler theories to more complicated theories "because their empirical substance is greater; and because they are more tested." The argument is that a simple theory is more easily falsifiable than a more complex one since it relates to more circumstances. This is another example of comparing a simple theory to a more complex theory that both adequately explain the evidence.

METHODOLOGY

Could the seeds of future worlds exist in our current reality right now if our universe has the ability to birth other universes? When we look around our world, we notice one type of item that could fulfil the description of a singularity, which is regarded to be the source of universes. Black holes are the objects in question. A black hole, with the ability to concentrate a universe's worth of energy in a singularity, is an ideal contender for the birth of a universe. In comparison to other hypothetical theoretical possibilities, Occam's razor suggests that black holes are the antecedents to universes because we know they exist.

Then there is the question of what caused the big bang. What is the procedure for detonating a black hole? We can presume that black holes do not erupt in their parent world based on what we know about black holes and science. Without breaching hundreds of scientific principles, it will be difficult to provide a convincing mechanism for such. A more straightforward logical path would be for a black hole to spew its contents somewhere else in one giant belch.

This theorized process works in a similar way to how white holes are thought to function. White holes are hypothetical 'things' in space connected to black holes via wormholes. Whatever matter their partner black hole absorbs, they vomit out. Wormholes and white holes, on the other hand, are meant to be ‘continual' links that perpetually spew out matter and energy. This feature contradicts the Big Bang, which was a single massive explosion [7].

We need a trigger for a black hole to go through a process that results in the black hole expelling its contents in one enormous explosion in a different location, based on the concept of white holes. Let us consider what a black hole could do when it reaches that mind-boggling mass, given that the black hole that reportedly generated our universe held all of the energy in our

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universe. Could the gravitational forces of such a massive black hole 'rip' a hole in space-time and eject its contents in a single massive explosion? Consider this; we frequently depict space-time and gravity as a piece of fabric with a ball in the center.

Based on the concept of white holes, we need a trigger for a black hole to go through a process that results in the black hole releasing its contents in one massive explosion in a new location. Consider what a black hole could do if it reaches that mind-boggling mass, given that the black hole that allegedly created our universe contained all of our universe's energy. Could such a large black hole's gravitational forces rip a hole in space-time and release its contents in a single cataclysmic explosion? Consider this: space-time and gravity are commonly depicted as a piece of fabric with a ball in the center.

Let us return to black holes as a possible mechanism for breaking the law of conservation of energy, as they appear to represent the birth of the universe, and the severe conditions surrounding and inside them may be what defies the known laws of physics. Let's also take a look at a well-known quantum physics process that most nearly approaches 'energy generation' in any definition of the term. The presence of virtual particles will arise as a result of the uncertainty principle. This brings us to a hypothetical phenomenon called Hawking Radiation, which is almost as fascinating as a black hole.

RESULTS

If a black hole can obtain mass from nothing by the process proposed above, it will explain the existence of matter and provide a mechanism for black holes to eventually accumulate enough mass to tear through the fabric of space time and trigger a second Big Bang. Perhaps, at the very beginning of all universes, a pair of 'virtual' mini black holes appeared by happenstance, joined and got larger via Hawking Radiation, finally becoming massive enough to tear a hole through space-time to begin the first universe.

DISCUSSION AND CONCLUSION

To conclude, this paper proposes two basic arguments based on logic and Occam's razor: since our universe was assumed to begin with the explosion of a singularity, that singularity would logically have to come from somewhere. Looking around, we can observe that black holes closely resemble the singularity of the big bang and have the capacity to accumulate the mass of an entire universe. The simplest explanation for the existence of energy is that it is possible for the universe to create energy from nothing. The most basic explanation for energy's existence is that it is conceivable for the cosmos to create energy out of nothing.

When a black hole becomes huge enough, its gravitational field is capable of tearing through the fabric of space time and revealing all of its contents in a single massive explosion, resulting in the formation of a new universe.

Hawking Radiation could cause a black hole to accumulate mass because the 'negative' energy particles that fall into it add to its mass rather than removing from it, as previously thought. This is predicated on the hypothesis that a singularity could be fundamentally different from the matter it absorbs, allowing it to gain mass even from 'negative' particles.

Although one might legitimately argue that the suggestions in this paper are completely absurd, one can also agree that the underlying reasons are logical to a fault. Take the ideas with a grain of salt, as they are, after all, generic postulations developed in response to the base arguments, and the real mechanisms, if they exist at all, may differ drastically from what was originally presented here. However, when dealing with black holes, it is important to remember the fundamental arguments.

REFERENCES

1. Kumar KN, et al. Hawking radiation-an augmentation attrition model. Adv Natur Sci. 2012;5:14-33.
2. Barceló C, et al. Towards the observation of Hawking radiation in Bose–Einstein condensates. Int J Mod Phys A. 2003;18:3735.
3. Blumer A, et al. Occam's razor. Info Proc Lett. 1987;24:377-380.
4. Balasubramanian V. Statistical inference, Occam's razor, and statistical mechanics on the space of probability distributions. Neural Comput. 1997;9:349-368.
5. Soklakov AN. Occam’s razor as a formal basis for a physical theory. Found Phys Lett. 2002;15:107-135.
6. Van den Berg HA. Occam's razor: from Ockham's via moderna to modern data science. Sci Progress. 2018;101:261-272.
7. Bontly TD. Modified Occam's razor: parsimony, pragmatics, and the acquisition of word meaning. Mind Lang. 2005;20:288-312.