THE UNIVERSE DIDN'T BEGIN UNCAUSED: A NEW ARGUMENT FOR THE *KALĀM* CAUSAL PRINCIPLE

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Abstract

The causal principle of the *Kalām* cosmological argument—*Everything that begins to exist has a cause*—remains controversial. One common objection is that while the principle may apply to things within the universe, it does not apply to the universe itself. Here, I argue that if the universe began uncaused, then there is an extremely high probability that the universe began just moments ago with the appearance of age. However, I further argue that the general agreement of independent estimates for the universe's age provides powerful empirical evidence that if the universe began to exist, then the universe has a cause.

The Current State of the *Kalām* Causal Principle

Kalām cosmological arguments (KCAs), which seek to establish the existence of a first or beginning cause of the universe, have experienced a revival of philosophical interest in recent decades. William Lane Craig, one of the most notable defenders of KCAs, has formulated the argument as follows:

1. Everything that begins to exist has a cause.
2. The universe began to exist.

3. Therefore, the universe has a cause.[1]

In support of the first premise [the '*Kalām* Causal Principle' (KCP)], Craig has offered three supporting reasons: (1) *ex nihilo, nihil fit* - the KCP is rooted in the *a priori* metaphysical intuition that something cannot come into being from nothing; (2) *why only universes?* - if the universe began to exist uncaused, then it becomes inexplicable why anything or everything does not come into existence uncaused from nothing all the time; (3) *experiential confirmation* – constantly verified and never falsified by ordinary and scientific experience, the KCP can be defended as an empirical generalization that enjoys the strongest support offered by experience.[2]

However, Craig's supporting reasons for the KCP have not gone without criticism. Against the first reason (*ex nihilo, nihil fit*), Morriston provides two criteria which he believes should be used to determine if a proposition constitutes a genuine *a priori* intuition [i.e., (1) the proposition holds a kind of "luminosity" that makes it impossible not to believe and (2) the better we understand the proposition and what is involved in asserting it, the clearer the truth of the proposition becomes]. After assessing the KCP, Morriston concludes that it does not fulfill either criterion and thus should not be accepted *a priori*.[3] Additionally, Morriston has further argued:

> [Nothingness] has no power to "prevent" things from "springing into existence." What we are talking about here, after all, is *nothing at all* — "no matter, no

[1] Craig & Sinclair, "The Kalam Cosmological Argument." After concluding that the universe has a cause, Craig & Sinclair deduce that the cause possesses a number of theistic properties (Ibid., 190-196).

[2] Ibid., 182-190; see also (Loke, *God and ultimate origins*, 134-153) for a review of these arguments.

[3] Morriston, "Must the beginning of the universe have a personal cause?" 156-161.

> energy, no space, no time, no deity." And *nothing at all* has no power at all, not even the power to prevent things from existing. One must ask Craig, "If there were nothing at all, what would *make it true* that nothing could come into existence?"[4] (emphases Morriston's)

Against the second reason (*why only universes?*), Graham Oppy has argued that the initial state of reality (ISOR) is the only kind of thing that can begin to exist uncaused when there is nothing else in existence.[5] Additionally, Oppy has contended that co-occupation of the same spatial location in a universe by more than one object is impossible, and that the relevant spaces which uncaused objects might occupy upon coming into existence are already occupied by other objects—such that new objects would not be able to "pop" into existence uncaused within the universe.[6] Moreover, Morriston has argued that the KCP is a physical principle that only applies to things within the universe rather than a metaphysical principle that applies to the universe itself.[7] More recently, Michael Almeida has noted that perhaps "our world is one in which what we believe are the causal laws are statistical generalizations whose probabilities oscillate imperceptibly every 100 million years",[8] and we happen to live in an epoch where the probability of uncaused events occurring is infinitesimally small.[9]

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[4] Ibid., 153

[5] Oppy, "Uncaused Beginnings," 63-66; Oppy, "'Uncaused beginnings' revisited."

[6] Oppy, "Uncaused Beginnings," 66-70

[7] Morriston, "Causes and beginnings in the Kalam argument," 236.

[8] Almeida, *Cosmological Argument*, 38.

[9] Ibid., 37-38.

Against the third reason (*experiential confirmation)*, Quentin Smith, among others, has objected that we actually have observed events beginning to exist uncaused (e.g., quantum events).[10] Moreover, Oppy has argued that we have only ever experienced objects whose coming into existence are preceded by times at which those objects do not exist. Since the beginning of the universe would also involve the beginning of time itself (i.e., the universe would begin to exist at $t = 0$), nothing in experience bears on the question of the causal antecedents of objects that begin to exist at $t = 0$.[11] Furthermore, Adolf Grünbaum has noted that we have only ever observed the transformation of previously existing materials from one state to another, such that our experience provides no insight into the *ex nihilo* beginnings of the universe.[12] Lastly, Morriston has pointed out that appealing to empirical generalizations can actually backfire on proponents of the KCA. Here, Morriston offers two additional causal principles that enjoy as much empirical support as the KCP: (1) everything that begins to exist has a material cause and (2) causes always stand in temporal relations to their effects.[13] Both of these empirical generalizations are violated by defenders of the KCA who want to contend that God, in a timeless state, creates the universe out of nothing.

While Craig has responded to these objections in turn,[14] whether the KCP applies to the universe remains a point of controversy. Since then, additional arguments for the KCP have also

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[10] Smith, *Theism, atheism, and big bang cosmology,* 121.

[11] Oppy, *Arguing about gods*, 149.

[12] Grünbaum, "The pseudo-problem of creation in physical cosmology," 380.

[13] Morriston, "Must the beginning of the universe have a personal cause?" 162-163.

[14] Craig, "Graham Oppy on the kalām cosmological argument."; Craig, "In defense of the kalam cosmological argument"; Craig, "Must the beginning of the universe have a personal cause?: A

been furnished by others. Spencer Case, for example, has contended that if we have empirical confirmation that material objects with beginnings cannot come into being uncaused in the actual world, then we have empirical confirmation that *groups* of material objects (including the universe which is the largest group of material objects) cannot come into being uncaused.[15] Moreover, Rad Miksa has argued that if the universe began uncaused, then an absurd universe would be as likely to begin uncaused as a normal universe, generating serious skepticism over the reliability of our cognitive faculties.[16] Furthermore, Andrew Loke has argued that if the universe began uncaused, then other events which begin to exist (e.g., a rapid increasing in strength of electric fields around me) would also begin uncaused. Moreover, if the universe began uncaused, then there would be countless parallel universes which also begin uncaused and which would have collided into our own universe, leaving behind a huge number of detectable 'scars' in our universe's cosmic microwave background. Since neither of these are what we observe, then the universe did not begin uncaused.[17] Loke has also appealed to the apparent fine-tuning of the universe as evidence that the universe did not begin uncaused.[18]

Given that the aim of Craig's KCA is to establish that the universe has a cause of its beginning, the crucial premise to be defended is that the KCP applies to the universe. Reflecting this recognition, Craig has presented the KCA in more recent writings utilizing the 'restricted

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rejoinder"; Craig and Sinclair, "The Kalam Cosmological Argument."; Craig, "Reflections On 'Uncaused Beginnings'."; Craig, "Graham Oppy on the Kalam Cosmological Argument."

[15] Case, "A Limited Defense of the Kalām Cosmological Argument."

[16] Miksa, "Deny the Kalam's Causal Principle, Embrace Absurdity."

[17] Loke, *The Teleological and Kalam Cosmological Arguments Revisited*, chap. 3.

[18] Ibid., 118-121

Kalām Causal Principle': *if the universe began to exist, then the universe has a cause*.[19] This opens the door to novel arguments that may not necessarily buttress the original KCP, but that do offer strong support for the restricted KCP (which is all that is needed for Craig's KCA to remain valid). One such family of arguments entails appealing to certain empirical features of our observable universe that provide compelling evidence for the restricted KCP. In light of this, here I present a new argument which contends that the general agreement of independent, scientifically-valid estimates for the age of the universe provides powerful empirical evidence that if the universe began to exist, then the universe has a cause.

The Cosmogonic Argument for the Restricted *Kalām* Causal Principle

According to standard physical cosmology, the universe began with a great explosion known as the 'Big Bang'.[20] In other words, the initial state[21] of the universe was the state of the universe at the Big Bang ('Big Bang state'). The laws of nature then specified the rules which determine

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[19] Craig, "The Kalam Cosmological Argument", 390.

[20] For the rest of the paper, I will assume that the universe began with the Big Bang. In premise 1.3, I will show why pre-Big Bang cosmologies, even if they are physically possible, do not affect the soundness of this argument.

[21] There are multiple ways to model the possible states of the universe depending on the relevant branch of physics. Under classical statistical mechanics, the universe's phase space is the space of possible states (or configurations) of the universe, where states comprise the positions and momenta of all particles in the universe at that particular moment of time. Under general relativity, the space of possible states of the universe (known as superspace) contain only those universe states whose three-dimensional space-time geometries are consistent with the Einstein Field Equations. Under quantum cosmology, the state of the universe is understood to be, in principle, represented by a wavefunction known as the universal wavefunction. This universal wavefunction can then be further mapped onto some other state space (which comprises all possible universe wavefunctions), though the metaphysical status of state space in quantum mechanics remains controversial; see (Schmid & Linford, *Existential Inertia and Classical Theistic Proofs*, 290-291) for a review of current proposals. I thank the anonymous referee whose feedback prompted this note.

how the initial state at the Big Bang evolved into other states across the temporal dimension. The 'Big Bang universe' in its history, then, is passing through a succession of states along a continuous curve ('Big Bang configuration space'), as determined by the laws of nature, stretching from the Big Bang state to the present state and beyond. Through the use of multiple independent dating techniques, cosmologists have determined that the Big Bang occurred some 13.8 billion years ago.

In the mid-19th century, amidst mounting geological evidence which indicated that the world was much older than a few thousand years, Philip Henry Gosse infamously proposed the 'Omphalos Hypothesis' where God created the world with all the physical appearances of being much older than it actually was—such that no empirical evidence about the age of the world could be taken to be reliable.[22] When modernized in light of contemporary cosmology, the Omphalos Hypothesis posits that the universe's initial state was not the Big Bang state, but rather could have been any subsequent state within the Big Bang configuration space, including the state of the universe 5 minutes ago.[23]

Though a seemingly absurd idea, I will argue that if the universe began uncaused, then it is almost certainly the case that we live in a universe that appears to us to be much older than it actually is ('Omphalos universe').[24] However, I further argue that the stunning success of the cosmogonic enterprise in determining the age of the universe provides powerful empirical

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[22] I thank the anonymous referee who brought Gosse' Omphalos Hypothesis to my attention.

[23] In *The Analysis of Mind* (1921), Bertrand Russell has similarly argued that the universe could have sprung into existence just five minutes ago with the appearance of age and there would be no empirical evidence that could disprove this.

[24] I thank the anonymous referee who suggested the designation of 'Omphalos universes'.

evidence that we do not, in fact, live in a universe that began uncaused. Using Robin Collins' restricted version of the Likelihood Principle, I formulate the argument as follows:

1. Given that the universe began to exist, if the universe does not have a cause, then there is an extremely low probability that the universe is cosmogony-friendly: that is, $p(E|{\sim}C \,\&\, B) \approx 0$.
    1.1. Given that the universe began to exist, if the universe does not have a cause, then any possible universe state can begin to exist uncaused.
    1.2. If any possible universe state can begin to exist uncaused, then every possible universe state has an equal probability of beginning to exist uncaused.
    1.3. If every possible universe state has an equal probability of beginning to exist uncaused, then there is an extremely high probability that we live in an Omphalos universe that began to exist uncaused.
    1.4. If there is an extremely high probability that we live in an Omphalos universe that began to exist uncaused, then there is an extremely low probability that the universe is cosmogony-friendly.
2. Given that the universe began to exist, if the universe has a cause, then there is not an extremely low probability that the universe is cosmogony-friendly, that is: ${\sim}p(E|C \,\&\, B) \approx 0$.
3. The principle *if the universe began to exist, then the universe has a cause* (C|B) is independently motivated.
4. Therefore, by the restricted version of the Likelihood Principle, the fact that the universe is cosmogony-friendly provides strong evidence that if the universe began to exist, then the universe has a cause.

In defense of premise 3, we have already seen in the first section of this paper that the principle *if the universe began to exist, then the universe has a cause* is independently motivated by at least 8 additional arguments. The rest of the paper will be devoted to defending premises 1 and 2.

Defining key terms

C: The universe has a cause

E: We live in a cosmogony-friendly universe

B: Relevant background knowledge which includes that the universe began to exist

Universe: all contiguous space-time reality

Cosmogony-friendly universe: a universe in which independent, scientifically-valid estimates for the age of the universe generally agree with each other

Omphalos universe: a universe that appears to us to be older than it actually is

Age of the universe: the amount of time separating the present moment from the Big Bang

Begins to exist: something has a beginning if and only if it has a temporal extension, the extension is finite in the earlier than direction, and it has temporal edges/boundaries, that is, it does not have a static closed loop or a changeless/timeless phase that avoids an edge.[25]

Cause: “either an efficient or a material cause, and which is necessary or sufficient for an effect, understood as change.”[26]

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[25] Adapted from Loke, *The Teleological and Kalam Cosmological Arguments Revisited,* 39-40.

[26] Ibid., 44.

Restricted Version of the Likelihood Principle: "Let h_1 and h_2 be two competing hypotheses. According to the Likelihood Principle, an observation [*E*] counts as evidence in favor of hypothesis h_1 over h_2 if the observation is more probable under h_1 than h_2 . . . The restricted version limits the applicability of the Likelihood Principle to cases in which the hypothesis being confirmed is non-*ad hoc*. A sufficient condition for a hypothesis being non-*ad hoc* (in the sense used here) is that there are independent motivations for believing the hypothesis apart from the confirming data [*E*], or for the hypothesis to have been widely advocated prior to the confirming evidence."[27]

Premise 1.1. Given that the universe began to exist, if the universe does not have a cause, then any possible universe state can begin to exist uncaused.

Craig has noted that denying the KCP involves accepting the metaphysically absurd belief that the universe can begin to exist out of *nothing*.[28] In response, Morriston has objected that since *nothing* has no properties or powers, then there is nothing in *nothing* that would have the power to prevent things (such as the universe) from coming into existence uncaused.[29] However, Miksa has observed that if this is the case, then any and every kind of universe could begin to exist uncaused. Miksa writes:

> it needs to be noted that if nothing has no powers, no properties, no limits, no potentialities, and no constraints, then it does not have the power to prevent *any- and everything* from existing . . . what it means is that if the opponent of the KCA

[27] Collins, "The Teleological Argument," 205-206.

[28] Craig and Sinclair, "The Kalam Cosmological Argument," 182-186.

[29] Morriston, "Must the beginning of the universe have a personal cause?" 153.

> wants to claim that only universes could come into existence uncaused out of nothing, then even if this claim is accepted for the sake of argument, the fact remains that given nothing's lack of discrimination or constraints, then any and every kind of universe could come into being uncaused from nothing.[30] (emphases Miksa's)

Indeed, not only do causes bring about their effect, they also constrain the properties of the effect.[31] The color of the walls in my house are white because I painted them white. But if my house began to exist uncaused, then it seems that there would be nothing to constrain the colors of the walls to white; the walls of this uncaused house could be any possible color or combination of colors. The same line of reasoning applies to the universe. If the universe began to exist uncaused, then it seems that there would be nothing to constrain the features of the initial universe—such that any possible universe state could also begin to exist uncaused.

It could be objected, however, that there are non-causal explanations which make it the case that only certain state(s) of the universe can begin to exist uncaused. Oppy, for example, contends that there is only one state of the universe that can begin to exist uncaused, which he has termed the 'initial state of reality' (ISOR).[32] But is this actually the case?

Without a cause for the ISOR, the only three types of explanation which could, in principle, differentiate the ISOR from other universe states are either (1) a property of the ISOR,

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[30] Miksa, "Deny the Kalam's Causal Principle, Embrace Absurdity," 241-242.

[31] Weaver, *Fundamental causation*, 261.

[32] Oppy, "Uncaused Beginnings," 63-66; Oppy, "Ultimate Naturalistic Causal Explanations."; Oppy, "'Uncaused beginnings' revisited."

(2) a pre-existing entity which prevents these other universe states from beginning to exist uncaused, and/or (3) some other non-causal explanation. Against (1), Loke has observed that any difference in properties between ISOR and other possible universe states (in this case, the ability 'to begin to exist uncaused') would be had by them in the concrete only when they had already begun to exist—such that the possession of this property by ISOR would come too late in the explanatory chain to metaphysically ground the uncaused beginning of ISOR but not other possible universe states.[33] Against (2), since the universe would begin to exist uncaused "even though there is nothing else in existence" (in Oppy's own words),[34] then there would be no pre-existing concrete entities that make it incompatible for other possible universe states to begin to exist uncaused.

But could it be the case that (3) other non-causal explanations account for why only the ISOR can begin to exist uncaused? Schmid and Linford provide a list of candidate non-causal explanations, writing:

> But the mere fact that entities can begin without causes is not sufficient for concluding that entities can begin without explanations or sufficient reasons for their existence. For starters, there are lots of non-causal explanations—e.g., explanations involving metaphysical grounding, functional realization, metaphysical necessity, structural constraints, and so on. But there are other, much-overlooked explanatory avenues available as well. Bertrand Russell and Ernst Mach, for instance, endorsed metaphysical views consistent with

[33] Loke, *The Teleological and Kalam Cosmological Arguments Revisited,* 93-98.

[34] Oppy, "Uncaused beginnings," 64. This sentiment seems also to be shared by Morriston, "Must the beginning of the universe have a personal cause?" 153.

> determinism (and deterministic explanatory relations) but denied the existence of efficient causation altogether. Moreover, while McTaggart did not deny the existence of causation, McTaggart endorsed a radically revisionary conception of causation on which causal relations are not asymmetric.[35]

In response, metaphysical grounding would entail grounding on either concrete objects (e.g., water is grounded in hydrogen and oxygen atoms which are themselves grounded in subatomic particles) or abstract objects (e.g., the fact that I have two dollars in my hand when I am holding two one-dollar bills is grounded in the abstract concept of 1 + 1 = 2). However, if the beginning of ISOR is metaphysically grounded on concrete objects, then this would be considered material causation and fall under our definition of 'cause'. Moreover, Loke has argued that abstract objects cannot metaphysically ground the fact that only the ISOR can begin to exist uncaused.[36] Furthermore, functional realization would entail some sort of pre-existing entity from which the universe 'emerges' and would thus also be considered material causation. In response to Russell, Mach, and McTaggart's views of causation,[37] I refer readers to existing critiques of these views and defenses of causal realism.[38] It is similarly important to note that even if efficient causation were reducible/eliminable, material causation would still be a live form of causal explanation that remains unaddressed.

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[35] Schmid & Linford, *Existential inertia and classical theistic proofs*, 91; see additional response from Loke, "On God and the Beginning of the Universe," 11-12.

[36] Loke, *The Teleological and Kalam Cosmological Arguments Revisited*, 87-93.

[37] See also Linford, ""The Kalām cosmological argument meets the mentaculus."

[38]Weaver, *Fundamental causation: physics, metaphysics, and the deep structure of the world*; Loke, "On God and the Beginning of the Universe," 12.

What about explanations involving structural constraints? Taking an example from Oppy, structural constraints could explain the impossibility of universe states in which spatial locations are co-occupied by more than one object.[39] Moreover, mathematical explanations could explain why it is impossible for universe states with a finite number of elementary particles to simultaneously contain both an even and odd number of elementary particles.[40] However, these explanations do not only constrain the kinds of universe states that *can begin to exist uncaused*; they constrain the kinds of universe states that *can exist at all*. As a reminder, this premise of the argument is formulated as: *given that the universe began to exist, if the universe does not have a cause, then any* ***possible*** *universe state can begin to exist uncaused***.** Objectors need to posit examples of explanations from structural constraints (or other forms of non-causal explanations) which specifically limit the ability of beginning to exist uncaused to only certain *possible* universe states.

In this vein, Oppy has argued that it is metaphysically necessary that only the ISOR can begin to exist uncaused[41], noting that this conclusion is the natural outworking of his *Branching Actualism* theory of modality, which is comprised of two premises:

1. All possible worlds 'share' an initial history with the actual world.

[39] Oppy, "Uncaused Beginnings," 66-70.

[40] I thank the anonymous referee who provided this example.

[41] Oppy, "Uncaused Beginnings," 63-66; Oppy, "Ultimate Naturalistic Causal Explanations."; Oppy, "'Uncaused beginnings' revisited."

2. Possible worlds ‘branch’ from the actual world only as a result of the outworkings of objective chance.[42]

Given these two premises, it follows that the actual world either has a necessary initial state or segment. However, Brian Leftow has noted that positing necessity (i.e., ‘there is no possible alternative to the ISOR’) is not sufficient to explain actuality.[43] Rather, in addition to claiming that the ISOR is necessary, one must also explain how this sole alternative was realized.

Moreover, it needs to be noted that Oppy’s two premises by themselves do not get to the conclusion that the *universe itself* has a necessary initial state. To do that, Oppy must also posit that the *universe fully exhausts the actual world*. This is the key assumption that Oppy must also successfully defend, since his two premises do not entail that the initial state/segment of the actual world must be entirely physical. Indeed, theists can accept both premises and posit that the initial state/segment includes God. Given that the very purpose of the KCA is to deduce that the actual world includes a cause of the universe, to presuppose that the universe fully exhausts the actual world without supporting reasons would amount to nothing more than question-begging. Aware of this fact, Oppy has argued that the actual world just is the physical world on the grounds that naturalism is more theoretically virtuous than theism.[44] This means that Oppy’s objection to this premise rises or falls based on the persuasiveness of such reasons.

However, the explanatory paucity of Oppy’s naturalism is underscored by the fact that it does not *non-contrivedly* predict that the universe is cosmogony-friendly, whereas theism does

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[42] Oppy, "“Ultimate Naturalistic Causal Explanations,” 47.

[43] Leftow, God and Necessity, 51-54; Leftow, “A naturalist cosmological argument”, 328.

[44] Oppy, “Ultimate Naturalistic Causal Explanations,” 50-56.

(as I will argue in premise 2). Indeed, given that my argument is formulated using Collins' restricted version of the Likelihood Principle, not only must the objector posit a non-causal explanation (such as metaphysical necessity) that could in principle account for why only the ISOR can begin to exist uncaused, the objector—in order to avoid *ad hoc*-ness—must also provide independent reasons for believing that this non-causal explanation would bring about an initial universe state that is cosmogony-friendly. To illustrate this point, Collins writes:

> suppose that I roll a die 20 times and it comes up some apparently random sequence of numbers . . . The probability of its coming up in this sequence is one in 3.6 X 10^{15} . . . To explain this occurrence, suppose I invented the hypothesis that there is a demon whose favorite number is just the aforementioned sequence of numbers, and that this demon had a strong desire for that sequence to turn up when I rolled the die. Now, if this demon hypothesis were true, then the fact that the die came up in this sequence would be expected – that is, the sequence would not be epistemically improbable . . . But this seems counterintuitive: given a sort of commonsense notion of confirmation, it does not seem that the demon hypothesis is confirmed.[45]

Indeed, it seems shamelessly *ad hoc* to posit that the outcomes of the dice rolls are expected under the demon hypothesis only *after* the outcomes of the dice rolls are observed and without any independent reasons to believe that the demon would prefer that specific outcome. Similarly, even if we concede that the ISOR is necessary (and that necessity explains actuality), this does nothing to predict what the features of the ISOR are. In other words, we have no independent

[45] Collins, "The Teleological Argument," 206.

reasons to believe that the necessary ISOR would yield a cosmogony-friendly universe. With no reasons to pinpoint any specific universe state as the necessary ISOR, we should, per the Principle of Indifference[46], assign every possible universe state an equal probability of being the necessary ISOR. In the end, all we have accomplished is to push the problem back a level. The conjunction of premises 1.1 and 1.2 (*Given that the universe began to exist, if the universe does not have a cause, then every universe state has an equal probability of beginning to exist uncaused*) still stands.

In this section, I have argued that none of the aforementioned non-causal explanations can metaphysically account for why only the ISOR can begin to exist uncaused. However, even if there exists some non-causal explanation that could in principle account for why only the ISOR can begin to exist uncaused, it would need to also predict, in a non-*ad hoc* manner, that the ISOR would give rise to a cosmogony-friendly universe. Therefore, even if one believes that the universe's beginning is not *metaphysically* brute—in the absence of any evidence as to which possible universe state would be the ISOR—it would still be *epistemically* brute.

An anonymous referee raised an additional non-causal explanation that should be addressed. The referee first points out that many theists believe if God, as an omnipotent temporal being, presently has the belief that God was the first entity to exist, then God's present beliefs non-causally necessitate the fact that no other entity could have been the first entity. Similarly, God, even prior to creation, would have held the same belief. In *tu quoque* fashion, the referee then contends that the naturalist could similarly posit some impersonal entity which non-

[46] The Principle of Indifference states that we should assign equal probabilities to every possible outcome if we have no reason to assign them unequal probabilities. Objections to this principle will be addressed in premise 1.2.

causally necessitates the properties of the initial universe state. However, the theist need not concede that such a non-causal explanatory avenue exists. One could, for example, contend that God is timeless (as many do). Moreover, those who do believe God to be temporal could argue that it is the fact that God was the first entity to exist which necessitates God's present belief of this fact. In other words, the explanatory arrow is reversed. Furthermore, given that God is a concrete beginningless entity, his existence from eternity past could have made it incompatible for other entities such as the universe from being the first entity. For this *tu quoque* objection to work, the objector would have to posit the existence of some other concrete beginningless entity that is not God or the universe but that would non-contrivedly prevent all universe states besides a cosmogony-friendly universe state from beginning to exist uncaused—a difficult task. Moreover, as we have previously seen, Oppy recognizes that the universe would begin to exist uncaused "even though there is nothing else in existence".[47]

If the ISOR has neither causal nor non-causal explanations for its properties, then it follows that the properties of the ISOR are metaphysically brute. Loke has noted that by appealing to brute fact, the objector is recognizing that there is no possible explanation (and, hence, no metaphysical basis) for why only the ISOR, rather than another universe state, can begin to exist uncaused. However, if there is no metaphysical basis which makes it the case that only the ISOR can begin to exist uncaused, then there is, in actuality, nothing to restrict other possible universe states from beginning to exist uncaused.[48]

In summary, the justification for premise 1.1 can be formally written as follows:

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[47] See note 34.

[48] Loke, *The Teleological and Kalam Cosmological Arguments Revisited*, 80-86.

1. If the ISOR begins to exist uncaused, this implies that the beginning of the ISOR would not have causally necessary condition(s) which make it the case that only the ISOR, rather than other possible universe states, begins to exist.
2. Any difference in properties between the ISOR and other possible universe states (including the ability 'to begin to exist uncaused') would be had by them in the concrete only when they had already begun to exist.
3. Since the ISOR would begin to exist uncaused when there is nothing else in existence, then there would be no pre-existing entity that makes it incompatible for other possible universe states to begin to exist uncaused.
4. Other non-causal explanations cannot explain why only the ISOR, but not other possible universe states, begins to exist uncaused.

(1), (2), (3), and (4) jointly imply that there are no relevant differences between the ISOR and other possible universe states where beginning to exist uncaused is concerned.[49] Therefore, if the universe began to exist uncaused, then any possible universe state can begin to exist uncaused as well.

Premise 1.2. If any possible universe state can begin to exist uncaused, then every possible universe state has an equal probability of beginning to exist uncaused.

In the previous section, we established that if the universe began to exist uncaused (i.e., without efficient or material cause), then there would be nothing to constrain the properties of the universe's initial state, thus making it the case that every possible universe state can begin to

[49] This line of justification was adapted from Loke, *The Teleological and Kalam Cosmological Arguments Revisited,* 113. Moreover, it is important to note that this justification is compatible with both A- and B- theories of time.

exist uncaused. Likewise, if the universe began to exist uncaused from nothing, then there would similarly be nothing — no constraints, predispositions, or powers — to *preferably* allow any specific universe state to begin to exist uncaused over another. Put another way: for some event to be more probable than another, there would need to be something explanatorily prior to the event which grounds this asymmetric probability. However, if the universe began to exist uncaused from nothing, then there would, in fact, be nothing to ground such an asymmetric probability. This means that if any possible universe state can begin to exist uncaused, then every possible universe state has an equal probability of doing so.[50]

Objections regarding the Principle of Indifference

It could be objected that this line of reasoning relies on the Principle of Indifference, which has been criticized on the grounds that it gives rise to a number of paradoxes.[51] However, Robin Collins, in his defense of the fine-tuning argument, has formulated a 'restricted version of the Principle of Indifference' which avoids such paradoxes. Collins' version goes:

> when we have no reason to prefer any one value of a variable p over another in some range R, we should assign equal epistemic probabilities to equal ranges of p that are in R, given that p constitutes a "natural variable." A variable is defined as

[50] Some have distinguished between an event being a brute fact and it occurring by chance, arguing that these two things are mutually exclusive. See Waller*, Cosmological fine-tuning arguments,* 46-53 for a discussion and response to this objection.

[51] Gillies, *Philosophical Theories of Probability,* 37-42. I thank the anonymous referee who brought this objection to my attention.

> "natural" if it occurs within the simplest formulation of the relevant area of physics.[52]

Here, we too can deploy Collins' restricted Principle of Indifference to resolve the paradoxes associated with the original principle. But what is the "natural variable" in our case? When we say that the universe began to exist, we are saying that the universe has an initial *state*. This denotes that there is a smallest, indivisible unit of time (i.e., a 'moment') which can be used to objectively divide up the possibility space into individual states. Given this, the natural variable in our case would be the state of the universe at a particular moment of time, as described by the relevant area of physics.[53]

Premise 1.3. If every possible universe state has an equal probability of beginning to exist uncaused, then there is an extremely high probability that we live in an Omphalos universe that began to exist uncaused.

In the previous sections, we have established that if the universe began uncaused, then every possible universe state has an equal probability of beginning to exist uncaused. Picture with me the history of the universe as proposed by modern cosmology, whose initial state is the Big Bang state about 13.8 billion years ago and which then stretches to our present moment's state. A universe whose initial state is the Big Bang state represents just one universe compared to the countless array of possible Omphalos universes whose initial state is subsequent to the Big Bang state in our universe's proposed history. By asserting that the universe began uncaused, one must concede that each of the countless number of Omphalos universes is equally likely to begin to

[52] Collins, "The Teleological Argument," 234.

[53] See note 21 on the ways to describe universe states.

exist uncaused as is the single Big Bang universe. Indeed, with every passing moment of time, the chances that we live in an Omphalos universe increases further. Therefore, it seems all but certain that we live in an Omphalos universe rather than the Big Bang universe.[54]

Why we likely live in a recent Omphalos universe

In response, some may object that a universe which began to exist five minutes ago with the appearance of age has an initial state that is far too complex—filled with galaxies, stars, and at least a few billion intelligent beings—to have come into existence by chance compared to the seemingly much simpler initial state of the Big Bang.

However, because of the entropic arrow of time, it is actually *more* probable that we live in a recent Omphalos universe (e.g., one that began to exist 5 minutes ago) compared to an ancient Omphalos universe (e.g., one that began to exist 5 billion years ago) or the Big Bang universe that began some 13.8 billion years ago. Given that (1) the 2nd Law of Thermodynamics implies that entropy in the universe has been increasing with the progression of time,[55] (2) there are more possible universe states with higher entropy than lower entropy,[56] and (3) every

[54] When calculating probabilities for what was the initial state of *our* universe, we should only take into account possible states of the universe that can give rise to what we have observed so far. An argument could be made that this probability calculus should also include possible universes where our sense perceptions are unreliable and we are experiencing illusions of the present moment that are contrary to what the universe is actually like, such as Boltzmann brain universes. Those who deny the KCP must somehow also account for why we likely don't live in such universes, lest they devolve into global epistemic skepticism (see also Miksa, 2020).

[55] Although objectors could reject the Past Hypothesis, Daniel Linford (2022, p. 217- 220) has noted that doing so would lead to global skepticism about our knowledge of the past and in the process ultimately undermine all of our scientific knowledge.

[56] This is definitionally true; entropy is a measure of the number of microstates corresponding to a macrostate.

possible universe state has an equal probability of beginning to exist uncaused, then it follows that: if the universe began uncaused, then it is more likely that we live in a universe that began closer to our present moment than father away from it.[57]

The odds are further stacked in favor of living in a recent Omphalos universe when we account for the fact that our observation radius is limited by our past light cone, whose size is proportional to the age of the universe. For example, if the universe is 5 minutes old, then the radius of our past light cone is only 5 light-minutes. This means that for the universe to begin to exist with the illusion of age, only the particles within our past light cone would need to be configured 'correctly' to give *us* this illusion. This line of reasoning would ultimately make it exponentially more likely that we live in an Omphalos universe that began closer to our present moment than farther away from it. After all, a younger universe entails a smaller past light cone which entails fewer particles that need to be configured 'correctly' to give the universe the appearance of age which ultimately entails more possible universe states with that configuration.

Indeed, using formulas derived by Alexander Pruss (and allowing for some incredibly generous assumptions against our conclusion), we can calculate that if the universe began to exist uncaused, then it is astronomically more likely ($>10^{10^{\wedge}59}$ to 1 odds) that the universe began less than 5 minutes ago with the appearance of age compared to more than 10 minutes ago with the appearance of age.[58] In other words, if the universe began uncaused, then it is all but certain

[57] See also Blackburn, *Think*, 46-47.

[58] In (Pruss, 2019), Alexander Pruss determines that "getting 10^N particles in the right configuration has, very roughly, a probability of around $10^{-10^{\wedge}(N+3)}$". The 10-minute past light cone (which includes the Sun) contains $\sim 10^{30}$ kg in mass. Moreover, Pruss remarks that "There are no more than about 10^{25} atoms, and hence about 10^{27} particles, per kilogram." This means that the chances the universe began with a perfectly configured 10-minute past light cone is ~1 in $10^{10^{\wedge}60}$. Given that any Omphalos universe more than 10 minutes old would have even more

that the universe and everything in it sprung into existence just moments ago with the appearance of age—filled with false memories and physical records of a non-existent past. The staggering epistemic and existential implications of such a view should, on their own, strongly discourage any rational person from holding that the universe began uncaused.[59]

Objections regarding pre-Big Bang cosmologies

It might be objected that this line of argumentation does not account for pre-Big Bang cosmological scenarios such as bouncing or eternal inflation universe models.[60] However, we have already established that if the universe began uncaused, the chances that the universe began more than 10 minutes ago as opposed to less than 5 minutes ago with the appearance of age is astronomically small. Moreover, Penrose has calculated the chances that the universe began with

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particles that would need to be configured correctly and thus be even less likely to be configured correctly, let's generously assume that all Omphalos universes more than 10 minutes old have the same probability of beginning to exist uncaused as a 10-minute-old Omphalos universe.

Similarly, the 5-minute past light cone (which includes Earth, Venus, and Mars) contains ~10^{24} kg in mass. Therefore, the chances that the universe began with a perfectly configured 5-minute past light cone is 1 in $10^{10^{55}}$. Let's conservatively assume that all Omphalos universes less than 5 minutes old have the same probability of beginning to exist uncaused as a 5-minute-old Omphalos universe. Moreover, the ratio of the number of 10-minute-or-older Omphalos universe states compared to the number of 5-minute-or-younger Omphalos universe states is roughly the ratio of 13.8 billion years to 5 minutes (or $1.45*10^{15}$ to 1).

From this, we can calculate the probability that we live in a 10-minute-or-older Omphalos universe to be $(1.45*10^{15}*N)/(10^{10^{60}})$ and the probability that we live in a 5-minute-or-younger Omphalos universe to be $N/(10^{10^{55}})$, where *N* is the number of 5-minute-or-younger Omphalos universe states. Therefore, the odds that we live in a 5-minute-or-younger Omphalos universe compared to a 10-minute-or-older Omphalos universe is roughly estimated to be $(10^{10^{60}}*N)/(1.45*10^{15}*10^{10^{55}}*N)$ or, more simply, ~$10^{10^{59.999996}}$ to 1.

[59] See Malcolm, *Knowledge and Certainty*, 200-201; Morris, *Anselmian Explorations*, chap. 8.

[60] I thank the anonymous referee who raised this objection.

the Big Bang are even smaller (~1 in $10^{10^{123}}$).[61] Given the entropic arrow of time, it follows that it would be *even less likely* that we live in a universe that began with a pre-Big Bang state than one that began with the Big Bang state.[62] Therefore, even if it turns out that the true model of the universe allows for Pre-Big Bang scenarios, we would still conclude that if the universe began uncaused, then it is astronomically unlikely that the universe began with a pre-Big Bang state.

Premise 1.4. If there is an extremely high probability that we live in an Omphalos universe that began to exist uncaused, then there is an extremely low probability that the universe is cosmogony-friendly.

In this section, I will argue that the number of possible Omphalos universes where independent, scientifically-valid estimates for the age of the universe do ***not*** generally agree with each other ('cosmogony-unfriendly universes') vastly outnumbers possible Omphalos universes that are cosmogony-friendly. When combined with the fact that every possible Omphalos universe has an equal probability of beginning to exist without a cause (from premise 1.2), it follows that if there is an extremely high probability that we live in an Omphalos universe that began uncaused, then there is an extremely low probability that the universe is cosmogony-friendly.

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[61] Roger Penrose, *Fashion, faith, and fantasy in the new physics of the universe*, 270-275.

[62] Alexander Vilenkin (2015) writes, "The second law [of thermodynamics] requires that entropy should increase in each cycle of cosmic evolution." Granted, there have been bouncing universe models proposed which contain mechanisms that restore the observable universe to a low entropy state. However, after reviewing existing bouncing universe models, Battefeld & Peter (2015) conclude that "attempts to investigate bouncing cosmologies as an alternative to the inflationary paradigm have been riddled with difficulties, roadblocks and no-go theorems". See additional critiques by Craig & Sinclair (2009), Brandenberger & Peter (2017), and Bhatnagar (2022). Similarly, for eternal inflation models, Aron Wall (2018), has noted that if the Generalized Second Law of Thermodynamics is to be satisfied, then "no baby universes forming inside of black holes can be viable (in the sense of eventually becoming causally independent of the mother universe)".

As a reminder, I have defined 'Omphalos universe' as any universe that appears to us to be older than it actually is. For us to live in an Omphalos universe, it seems sufficient that only the particles within our past light cone that we have observed *so far* are configured 'correctly' to give us the impression that the universe is much older than it actually is. This means that there might exist countless natural phenomena in our past light cone yet to be observed, but—were we to observe them—would reveal that all is not as it appears to be. Excellent candidates for such natural phenomena are those that are not directly perceivable by the unaided senses, but that require specialized instrumentation to observe and advanced knowledge to interpret—such as those used to determine the age of the universe.

As an analogy, imagine that we lived in a world where many dinosaur fossils recently fluctuated into existence uncaused in the Earth's geological record, and paleontologists wanted to determine whether a fossil they had just discovered was the remnant of a dinosaur that had actually lived in the past. There is a myriad of methods to estimate a fossil's age, such as extrapolating from the ratio of certain carbon isotopes to nitrogen isotopes in the fossil or determining the age of the sedimentary rock layer in which the fossil was discovered. If the fossil came from an actual dinosaur, then there would have been a 'cause' (i.e., the dinosaur and its environment) to constrain the properties of the fossil such that the estimated age of the fossil between all these methods would generally agree with each other. However, if the fossil popped into existence uncaused, then there would be nothing to constrain its carbon to nitrogen isotope ratio, the layer of sedimentary rock in which it resided prior to discovery, or any other property of the fossil used to determine its age—such that the results from these dating methods would almost certainly not agree with each other. Therefore, by comparing the results from independent methods for determining the age of the fossil, paleontologists could determine whether the fossil sprung into existence uncaused or came from an actual dinosaur. A similar strategy can be used to determine whether the universe began to exist uncaused.

Cosmologists have devised at least 5 independent techniques to estimate the age of the universe:[63]

1. Size and expansion rate of the universe
2. Cosmic background radiation power spectrum analysis
3. Cooling times for white dwarfs in the Milky Way
4. Radiometric and spectroscopic dating of stars
5. Turn off-points for globular star clusters

All five of these methods assume that the universe began with the Big Bang and has left cosmological remnants (e.g., current size of the universe, cosmic background radiation, stars, etc.) which can be used to estimate the age of the universe. However, if we live in an Omphalos universe that began uncaused, then there would be no causal link between those cosmological remnants today and the Big Bang (since the Big Bang didn't occur). In other words, there would be nothing to constrain the initial features of these remnants—such that the probability they provide a coherent age of the universe is vanishingly small. We will now look into each specific dating method in turn.

Size and expansion rate of the universe

Cosmologists have long observed that the universe is expanding in size. The relative rate at which the universe is expanding ('the Hubble constant') is a function of the age of the universe.

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[63] For a detailed explanation of these dating techniques, see (Weintraub, *How Old is the Universe?*) and (Gribbin, *13.8*).

By determining the Hubble's constant, cosmologists can calculate how long it would have taken the universe to reach its current size from the initial Big Bang singularity. From this, the age of the universe has been estimated to be 13.8$\pm$0.1 billion years.[64]

This calculation assumes that the universe began with the infinitesimally small Big Bang singularity. However, if we live in an uncaused universe, this key assumption would almost certainly be false; for without a cause of its beginning, the initial state of the universe could take on any of a vast range of possible sizes (a range which, very plausibly, goes to infinity). In light of this, estimating the universe's age based on how long it would take the universe to reach its current size from the initial Big Bang singularity would be scientifically bankrupt since it would almost certainly not be the case that the universe began with the size of the Big Bang singularity or any size remotely close to it.

Cosmic background radiation power spectrum analysis

The cosmic microwave background (CMB) is the result of radiation emitted in the very early universe after the Big Bang and is marked by temperature variations across the observable universe. Cosmologists have been able to measure and map out the temperature distribution of the CMB. To determine the age of the universe, the results of these temperature maps—along with values for the flatness of the universe, the current and past expansion rates of the universe, and the total amount of dark energy, dark matter, and normal matter—are interpreted with

[64] Bahcall, "Hubbles Law and the expanding universe."

mathematical models of the Big Bang universe (i.e., the Lambda-CDM model). From this, cosmologists have estimated the age of the universe to be 13.787±0.020 billion years.[65]

However, if we live in a universe that began to exist uncaused, then the temperature distributions of the CMB could have been any of a near-infinite range of initial patterns and values. Moreover, the total amount of dark energy, dark matter, and normal matter in the universe would also not be causally dependent on the Big Bang and thus could also have been any initial amount. If this were the case, then attempting to calculate the age of the universe from these measurements would be doomed to fail.

Stellar Dating Methods

If the universe began with the Big Bang, then there should be nothing in the universe (e.g., a star or planet) that is correctly estimated to be older than the universe itself. Therefore, by determining the age of the oldest entities in the universe, we can place a lower limit on the age of the universe. Cosmologists have developed at least three independent methods for determining the age of stars and globular star clusters based on their current properties (e.g., temperature, radioisotope amounts, etc.).

However, given that the overwhelmingly likely scenario is that we live in a (recent) Omphalos universe, this also means that the overwhelmingly likely scenario is that the initial state of our universe contained pre-formed stars (or at least the appearance of stars). With this, we are confronted with a devastating problem: since there would be no causal link between the

[65] Aghanim et al., "Planck 2018 results-VI. Cosmological parameters."

properties of those stars and the Big Bang, the initial properties of those stars could have taken on any of a vast range of possible values. We turn to those stellar dating methods now.

Cooling times of white dwarfs in the Milky Way

White dwarf stars are the remnants of intermediate- and low-mass stars after they have exhausted their nuclear fuel. Cosmologists can calculate the age of a white dwarf star based on its temperature today, the rate at which it has been cooling, and how hot it was to begin with. The first value is measured and the latter two are predicted based on stellar evolutionary models. The cooler a white dwarf star is today, the older it is. The oldest white dwarf stars to have been observed are J1102 (10.6-11 billion years old) and WD 0346 (9.6-11.5 billion years old).[66] Weintraub has noted that if the universe were more than 15 billion years old, then we should have observed white dwarfs that are cooler and fainter than any we have observed.[67] Therefore, this provides us with an age of the universe between 10.6 – 15 billion years old.

However, if we live in a universe that began to exist uncaused, then there would be nothing to constrain the initial temperatures of white dwarf stars in our universe. The initial state of an uncaused universe could easily have contained fully-formed white dwarf stars with temperatures leading to age estimates significantly older than 13.8 billion years.

Radiometric and spectroscopic dating of stars

By determining the proportions of different radioactive isotopes (such as uranium-238 and thorium-232) and/or heavy elements (such as oxygen and iron) in a star, cosmologists are able to

[66] Kilic et al., "11–12 Gyr old white dwarfs 30 pc away."

[67] Weintraub, *How Old is the Universe?*, 157-158.

infer the age of the star. When one looks at the ages of the oldest stars in the universe as estimated by such methods—including HE 1523-0901 (13.2±2.7 billion years[68]), HD 140283 (13.7±0.7 billion years[69]), and CS 31082-001 (14±2.4 billion years[70])—it is striking that there is no star, when error ranges are accounted for, determined to be older than the estimated age of the universe. It is also fair to assume that if the universe was older than 18 billion years, then we would have observed stars with much more ancient proportions of radioactive isotopes and/or heavy elements. Therefore, this provides us with an age of the universe between 13 and 18 billion years old.

However, if we live in a universe that began to exist uncaused, then there is nothing to constrain the initial chemical composition of stars. The stars in the initial state of an uncaused universe could take on any number of different initial radioactive isotope proportions and heavy element proportions. There could then easily have been a star estimated by these methods to be much older than 13.8 billion years old.

Turn off-points for globular star clusters

Globular star clusters are stable, tightly bound clusters of hundreds of thousands of stars. All stars within the same globular cluster form at roughly the same time and thus are roughly the same age. By measuring the temperature and luminosity of each star in a globular cluster and plotting them on a graph ('H-R diagram'), cosmologists can identify the 'turn-off point' on the diagram at which point stars in the globular cluster have exhausted their hydrogen fuel cores.

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[68] Febrel et al., "Discovery of HE 1523–0901,"

[69] Creevey et al., "Benchmark stars for Gaia,"

[70] Hill et al., "First stars. I. The extreme r-element rich, iron-poor halo giant CS 31082-001,"

Since the turn-off point of a globular cluster marches down toward lower luminosities and lower temperatures as the globular cluster ages, the turn-off point can then be used to estimate the age of the globular cluster. Valcin and colleagues calculated the absolute age of 68 globular clusters and determined the average age of the oldest globular clusters to be 12.89-13.75 billion years old. After accounting for the time it would have taken globular clusters to form after the Big Bang, these findings were then used to infer that the universe was between 13.03-13.99 billion years old.[71]

However, if we live in a universe that began to exist uncaused, then there is nothing to constrain the initial temperatures and luminosities of stars in the same globular cluster. In this scenario, when plotting the measured temperatures and luminosities of stars in the same globular cluster, we would not expect the resulting H-R diagram to exhibit any discernable pattern that could be used to locate the globular cluster's turn-off point. Therefore, it would not be possible to determine the age of a globular cluster with any degree of confidence. Moreover, even if the stars in a globular cluster did follow a discernable pattern for which we could determine its turn-off point; in a universe that began uncaused, there could easily have been a globular cluster that is estimated by these methods to be significantly older than 13.8 billion years.

Summary of universe age estimates

We have seen that if the universe began to exist uncaused, then it would be extremely improbable for all five independent, scientifically-valid estimates for the age of the universe to generally

[71] Valcin et al., "The age of the Universe with globular clusters,"

agree with each other. However, this is in fact what scientists have observed. The derived age of the universe from each dating technique is summarized in the table below.

Technique	Derived Age of Universe (billion years)
Expansion rate of the universe	13.8±0.1
Cosmic background radiation power spectrum analysis	13.787±0.020
Cooling times for white dwarfs in the Milky Way	10.6-15
Radiometric and spectroscopic dating of stars	13-18
Turn off-points for globular star clusters	13.03-13.99

Two independent methods for measuring the age of the universe—expansion rate of the universe and cosmic background radiation power spectrum analysis—estimate the universe to be ~13.8 billion years old. Moreover, three independent methods for measuring the age of the oldest stars or globular clusters in our universe have not estimated any to be older than 13.8 billion years old. As John Gribben observes, "the discovery that the ages of the oldest stars and the age of the universe are almost the same, with the stars (crucially) being slightly younger than the Universe in which they live is, indeed, one of the most profound discoveries ever made."[72] From all these lines of evidence, cosmologists have concluded that the universe began to exist some 13.8 billion years ago.

How confident are cosmologists about the age of the universe? Gribben writes:

> This number [13.8 billion years] is unlikely to change, and it is worth pausing to take on board the fact that at the end of 2015 the cosmological debate now

[72] Gribben, *13.8*, 219.

> revolves around small differences in the second decimal place, rather than there being any fundamental disagreements.[73]

David Weintraub similarly notes:

> Why are astronomers so confident? It turns out that their certainty is not hubris. They know that this number is the only valid answer to the question of the age of the universe because it emerges from a meticulous interpretation of all the data—from rocks, stars, galaxies, the whole universe—that humanity has painstakingly gathered over the centuries. It is the only answer that is consistent with the laws of physics as we know them and with the firm logic of mathematics and justified by the collective labors of astronomers, as well as of chemists, mathematicians, geologists, and physicists. The answer rests, in fact, on very solid foundations.[74]

Premise 2. Given that the universe began to exist, if the universe has a cause, then there is not an extremely low probability that the universe is cosmogony-friendly, that is: $\sim p(E|C \,\&\, B) \approx 0$.

If a cause brought the universe into existence and determined the properties of its initial state, then this would explain (at least in part) why we live in a cosmogony-friendly universe. However, it would still be natural to wonder why the cause of the universe specifically brought about a cosmogony-friendly universe as opposed to one of the countlessly many more

[73] Ibid., 217

[74] Weintraub, *How Old is the Universe?*, 3.

cosmogony-unfriendly universes. By just positing that the universe has a cause of its beginning, all we have done is push the problem back a level.

In order to increase the likelihood of this premise, there would need to be independent reasons for believing that there exists a cause predisposed to bring about either (1) a cosmogony-friendly universe or (2) a universe whose cosmogony-friendliness is a serendipitous by-product of other features of the initial universe that the cause was predisposed to bring about. There is at least one independently-motivated hypothesis of the former variety: theism. Robin Collins has argued that the fact our universe is amenable to scientific discoveries is expected under theism. Given God's perfect goodness, Collins contends that we would expect God to create a universe structured to realize a net positive balance of value—and provides six independent reasons for believing that the ability to study and understand the universe is indeed valuable, writing:

> First, it is difficult to think of a better way to affirm the importance of both reason and faith than to plant a powerful piece of evidence for God's existence at the very base of the citadel of reason itself, science. Second, science has given humans confidence in the power of human reason . . . Third, science allows us collectively to express the Image of God, and thereby contributes to human flourishing . . . Fourth, science allows us to appreciate the glory and ingenuity of God's creation in a way that is not possible without it. Fifth, though often not actually enacted, science at its best exemplifies many ideals of both community and individuality . . . Finally, the findings of science have inspired us with a sense

> of the elegance of the universe and given us a sense of transcendence via helping us see ourselves in a cosmic context.[75]

In light of this, it would be unsurprising for God to bring about a universe whose age could be accurately and precisely determined through the scientific method by intelligent observers within the universe.[76]

In summary, given the soundness of Premises 1-3, it follows that: *(Premise 4) Therefore, by the restricted version of the Likelihood Principle, the fact that the universe is cosmogony-friendly provides strong evidence that if the universe began to exist, then the universe has a cause.*

Conclusion

In this paper, I present a novel argument for the restricted KCP based on the stunning success of the cosmogonic enterprise in determining the universe's age. If the universe began to exist uncaused, then it would be all but certain that the universe began just moments ago with the appearance of age. Furthermore, if we were to live in such an uncaused universe, the universe would almost certainly not be cosmogony-friendly. However, we have multiple independent reasons to believe that if the universe began to exist with a cause, then the universe would be cosmogony-friendly. Contemporary scientific findings resoundingly reveal that we do, in fact, live in a cosmogony-friendly universe. Therefore, the general agreement of independent,

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[75] Collins, "The Argument from Physical Constants," 103.

[76] It could additionally be argued that we would expect an omni-benevolent God to bring about a universe where intelligent beings such as ourselves generally have reliable cognitive faculties. Therefore, it would be unsurprising for God to bring about a universe like the Big Bang universe where our memories would be generally reliable as opposed to an Omphalos universe that began recently where the vast majority of our memories would be of events that never actually occurred.

scientifically-valid estimates for the age of the universe provides powerful empirical evidence that *if the universe began to exist, then the universe has a cause*.

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