Between science and philosophy: Hypotheses on the existence of God and the future evolution of humanity into a deity

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Abstract

This article examines two related questions that have received insufficient academic attention: whether contemporary science leaves conceptual space for the existence of God or gods and under what conditions human or extraterrestrial civilizations might become "god-like." After surveying cosmological models, fine-tuning arguments, multiverse and simulation hypotheses, and scenarios such as technological singularity, the Barrow scale, and Omega Point theories, the paper argues that current physics and cosmology neither demonstrate nor rule out a deity. It also contends that future intelligent civilizations could acquire capacities that are maximal within given physical laws but still fall short of absolute omnipotence and omniscience in the classical theological sense. The central claim is that philosophy and science, together with advances in artificial intelligence, cosmological information theory, and possible contact with extraterrestrial intelligence, may significantly refine our assessment of views about God and of "god-like" futures, while supporting a stance of temporary pragmatic agnosticism.

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1. Introduction

The questions "Does God exist?" (Diller and Kasher, 2013; Spitzer, 2010; Stenger, 2007) and "Will human civilization one day become similar to God?" (Akinsanya, 2024; Estes, 2022; Prisco, 2013) remain the subject of endless scientific, philosophical, and theological debates. In recent decades, a scientific movement—primarily represented by Richard Dawkins, Lawrence Krauss, Stephen Hawking, and Leonard Mlodinow—has advocated for the non-existence of God. Dawkins (2006) asserts that evolution, governed by purely random processes, constitutes sufficient proof of the non-existence of God. Krauss (2012) argues that because our cosmos has emerged from a quantum fluctuation preceding the Big Bang, the God hypothesis is redundant. Hawking and Mlodinow (2010) employ multiverse theory to assert the non-existence of God, claiming that because our universe is merely one among infinite existing universes, a God is not needed to ignite the spark of the cosmos. Conversely, the idea that human civilization may one day acquire divine faculties is not reflected in the doctrines of established religions, such as Judaism, Christianity, and Islam. Indeed, a cornerstone of their dogmas is that humanity's inherent limitations, tied to its corrupt and mortal nature, prevent it from becoming akin to God. Regarding the possibility of determining whether God exists, Israeli mathematician Aczel (2014, p. 249) uses Gödel's incompleteness theorems to argue that humankind will never be able to definitively establish the existence or non-existence of God, because this question is beyond the reach of human comprehension. His reasoning applies to the idea that humanity may not acquire divine faculties because science is limited in that not all of nature can be understood by the human mind.

Against this background, the present article addresses two closely related research questions: first, to what extent do contemporary scientific theories about the origin and structure of the cosmos, emergence of life, and future of intelligence leave conceptual space for the existence of God or gods and second, under what conditions, if any, might human or extraterrestrial civilizations come to possess capacities that are meaningfully described as "god-like," while still remaining bounded by physical laws? Unlike the theses of Dawkins, Krauss, Hawking, and Mlodinow and the doctrines of various religions, I argue that not only is the hypothesis of God possible but also that we—along with extraterrestrials—may one day attain levels of knowledge and power such that we become akin to God in a qualified, analogical sense. I do not claim that future discoveries will make recourse to a divine being logically inevitable; rather, I maintain that advances in cosmology, astrobiology, information theory, and technology may strengthen or weaken different hypotheses involving God and the denial of God without compelling any single metaphysical conclusion. Similarly, when I speak of future civilizations

becoming "like God," I understand this as the attainment of capacities that are maximally extended within a given set of physical laws, and not as the acquisition of absolute omnipotence or omniscience in the classical theological sense. In section 2, I emphasize that studying physical laws, universal constants, the theory of everything, the solar system, life's origin, and evolution does not preclude the existence of God. Furthermore, I argue that humans and extraterrestrials may, in principle, gain quasi-divine faculties within the constraints of their respective cosmoi. In sections 3 and 4, I highlight scientific theories proposing the existence of God and the potential for humans to become god-like, and I clarify the distinction between physically maximal power and knowledge and the absolute attributes traditionally ascribed to a deity. Additionally, the question of God's existence may be better understood by studying infinite regression and infinite replication paradoxes. In section 5, I explore the possibility of human and extraterrestrial species determining whether God truly exists and contemplate whether humans and extraterrestrial civilizations will acquire divine-like faculties through the study of specific subjects and with the aid of particular means, including probabilistic and informational analyses.

In summary, throughout the manuscript, I emphasize the importance of philosophy, which is fundamental to a deeper understanding of various aspects related to God and to the question of our potential to become akin to Him, and of science, which is crucial in refining, and in some cases testing, these theories. The central thesis defended here is that current scientific knowledge neither demonstrates nor rules out the existence of God or gods; future progress may provide stronger empirical and conceptual grounds for preferring some positions over others, without making it epistemically unavoidable to appeal to a divine being. The idea that human or alien civilizations might become "god-like" should be interpreted as the possible realization of physically maximal but still finite capacities, rather than as the literal attainment of absolute omnipotence and omniscience. This work thus highlights the possibility—seldom explored within the academic community—that certain means could enable human civilizations both to investigate more rigorously the existence of God and to approach faculties of a quasi-divine nature, while remaining conceptually clear about the limits of such analogies.

2. Between science, philosophy and God: The finely tuned universe and the future of the cosmos

The Big Bang remains one of the few scientifically indisputable aspects of the cosmos, given that the discovery of cosmic microwave background radiation in 1964 and the COBE satellite detections in 1992 provided strong evidence that the universe

originated approximately 13.7 billion years ago. Although the Big Bang is an established scientific framework, questions concerning the physical processes that occurred at, or very near, its origin have provoked animated debates within academia. The presence of a tiny primordial energy core that imploded 13.7 billion years ago and gave rise to an ordered universe capable of harboring life remains one of cosmology's greatest mysteries. The Big Bang has compelled us to consider fundamental questions, such as those proposed by Leibniz (1898) in the eighteenth century when he asked, "Why is there something rather than nothing?" The Big Bang was followed by a series of highly specific physical processes, many of which gave rise to what we now describe as physical laws[3]. These laws—such as those of gravitation, relativity, and quantum mechanics—are all fundamental to preventing the universe from imploding or exploding, thus enabling planets to develop the conditions necessary for life. Philosophically, this invites both metaphysical questions about why there are such laws at all and epistemological questions about how far scientific explanation can reach before giving way to more ultimate forms of explanation. Albert Einstein emphasized the exceptional nature of physical laws in a letter to Romanian mathematician Maurice Solovine (1987, p. 118), acknowledging that logic should have led humanity to conclude that a universe dominated by chaos was more likely. Instead, our cosmos is characterized by the order of natural laws, whose presence was not logically required.

Closely related to the question of physical laws is the problem of a "theory of everything[4]," which seeks to unify all known physical processes within a single interpretative framework. Philosophically, the search for such a theory raises issues about reductionism, the status of unifying principles in science, and whether a final theory would really count as a complete explanation or would itself call for further justification. The main challenge in creating a theory of everything is developing a framework that reconciles two different domains of physical law—relativity and quantum mechanics—within the same universe. Relativity describes gravity on large scales, while quantum mechanics examines the three non-gravitational fundamental interactions—electromagnetism, the strong nuclear force, and the weak nuclear force—on small scales. To date, several theories of everything have been proposed, including string theory (Kaku, 1999), loop quantum gravity (Bojowald, 2010), causal fermion systems (Finster, 2006), causal set theory (Surya, 2019), causal dynamical triangulation (Ambjørn et al., 2010), and ER=EPR (Maldacena and Susskind, 2013). While these theories attempt to unify

[3] The study of the nature of physical laws was notably addressed by Feynman (1965).

[4] Barrow (1991), Close (2017), and Weinberg (1993) are some of the physicists who attempted to discover a theory of everything.

relativity and quantum mechanics, they neither explain why there is a cosmos at all—whether a single universe or an ensemble of infinite parallel or serial universes suitable for life—nor do they by themselves address the deeper metaphysical question of why there is a "lawful" structure rather than no universe at all. Most laws of physics possess universal constants[5], which remain the same throughout the observable universe. These universal constants comprise numerical values that, if even slightly different, would not have permitted the emergence of life or would have resulted in the demise of our cosmos billions of years ago.

Rees (1999) claims that our universe depends on six fundamental dimensionless constants: the ratio of electrical forces to gravity, strength of atomic bonds, amount of dark matter, magnitude of cosmic antigravity, "fabric" of the universe, and number of spatial dimensions. Life could not have emerged if these constants had differed slightly. The most crucial constant in his account is the atomic bond strength, set at 0.007; variations to 0.006 or 0.008 would have prevented life on Earth. This alleged "fine-tuning" extends beyond the constants Rees mentioned, including the strong nuclear force, fine-structure constant, cosmological constant, weak nuclear force, electromagnetic force, and gravity. Our existence would not be possible if any of these were even slightly different (Carroll, 2006; Hogan, 2000; Tegmark et al., 2006; Weinberg, 1987). Technically, these discussions engage with deep puzzles in high-energy and gravitational physics, such as the small but non-zero value of the cosmological constant and the apparent narrow life-permitting ranges of key dimensionless parameters, themes also discussed in Schellekens's (2013) analysis of life at the interface of particle physics and string theory. The fine-tuned universe, represented by the laws of nature, universal constants, and the search for a theory of everything, suggests that the hypothesis of the existence of God is one way of interpreting why the cosmos is life-permitting. However, as the philosophical literature has emphasized, the inferential step from fine-tuning to theism is controversial. Proponents of fine-tuning arguments for theism (Barnes, 2012; Collins, 2009; McGrew et al., 2001; Swinburne, 2004) argue that, given an appropriate probability framework, fine-tuning supports theism over chance or over non-theistic hypotheses. By contrast, critics (Colyvan et al., 2005; Dawid, 2013; Ikeda and Jefferys, 2006) contest whether the relevant probabilities are even well defined, or whether the data genuinely favor a theistic explanation. Thus, fine-tuning provides a powerful starting point for the dialogue between cosmology and the philosophy of religion but does not, by itself, settle that dialogue.

[5] The issue of universal constants has also been the subject of much scientific debate, as evidenced by Barrow (2002) and Eddington (1956).

To address the problem of the finely tuned universe—namely that of physical laws and universal constants—physicists have proposed various theories[6], such as multiverse scenarios, cyclic universes, "universe from nothing" models, and holographic-universe proposals. These aim to explain the universe's origins and its suitability for life. Multiverse theories include eternal inflation (Garriga and Vilenkin, 2001; Guth, 2007), black-hole cosmology (Good, 1972), cosmological natural selection (Smolin, 1997), and the many-worlds interpretation (Everett, 1957). Cyclic universe models include the Big Bounce (Ashtekar et al., 2006), the ekpyrotic universe (Steinhardt and Turok, 2007), conformal cyclic cosmology (Penrose, 2010), the quasi-steady-state universe theory (Hoyle et al., 1993), and the Baum–Frampton model (Baum and Frampton, 2008). Theories suggesting that the universe emerged "from nothing" include the Big Bang from quantum fluctuation (Tryon, 1973), the Hartle–Hawking state (Hartle and Hawking, 1983), emergent-universe scenarios (Ellis and Maartens, 2003), and quantum potential cosmology (Farag Ali and Das, 2015). The holographic-universe model has recently been defended by Hertog (2023). Philosophically, these proposals differ not only in physical mechanism but also in the kind of explanation they offer. Multiverse scenarios (Carr, 2007; Linde, 1990; Susskind, 2005) seem to "naturalize" fine-tuning by embedding our universe in a larger ensemble, so that it is not surprising that at least one domain is life-permitting. However, critics (Ellis, 2007; Ellis and Silk, 2014; Steinhardt, 2011) argue that such multiverse frameworks rely on entities (other universes) that may be permanently unobservable, face the so-called measure problem (how to assign probabilities over an infinite or vast ensemble), and risk merely shifting rather than resolving the question of why the totality is such as to generate life-permitting regions at all. Recent technical discussions of prediction and explanation in multiverse settings (Garriga and Vilenkin, 2008) emphasize that anthropic selection effects and measure choices are central but contested ingredients in attempts to account for fine-tuning in terms of an inflationary multiverse and a "landscape" of possible low-energy constants. Cyclic-universe models confront a partly different cluster of objections. Although they might appear to dilute fine-tuning by positing an eternally recurring cosmos or repeated cycles of contraction and expansion, critics note serious tensions with current observational cosmology, which favors a late-time accelerated expansion driven by dark energy rather than a future re-collapse. Moreover, cyclic scenarios must address challenges concerning entropy accumulation, the stability and robustness of successive

[6] Vaas (2011) pointed out that there are many scientifically plausible hypotheses about what might have preceded the Big Bang.

cycles, and the physical plausibility of the mechanisms proposed to reset initial conditions in a way compatible with life-permitting universes (Ellis, 2007; Steinhardt, 2011).

While multiverse and cyclic models face these epistemic and methodological challenges, universe-from-nothing and holographic proposals raise a somewhat different family of issues. Universe-from-nothing models, often inspired by quantum cosmology, have been subjected to substantial philosophical criticism. Earman (1995), Grünbaum (1991), and Oppy (2013), for instance, dispute whether such models genuinely describe creation ex nihilo rather than a reformulation of prior boundary conditions. On this view, quantum cosmological accounts tend to transform an initial classical singularity into a different kind of boundary condition, rather than eliminating the need for an initial state altogether (Craig and Sinclair, 2009; Grünbaum, 1991; Oppy, 2013). Holographic-universe theories, by contrast, typically posit a single universe whose bulk properties are encoded on a lower-dimensional boundary or emerge from a more fundamental informational or energetic substrate. Although rooted in developments in quantum gravity and black-hole thermodynamics, strongly holographic or otherwise highly speculative cosmological frameworks raise concerns about their empirical testability and explanatory status: it remains unclear to what extent they provide genuine answers to fine-tuning questions, as opposed to re-describing them in new formal terms (Ellis, 2007; Ellis and Silk, 2014; Rovelli, 2018; Smolin, 2015).

The issue with all these theories is that they do not render our universe obviously less special, even if they are proven empirically or theoretically adequate. Even if infinite parallel or serial universes existed[7], if the Big Bang had arisen from a quantum fluctuation, or if the laws of nature had evolved, the mystery would remain of why our cosmos possesses all the physical processes necessary for the development of life. A natural scientific perspective suggests that a randomly selected universe from a multiverse, cyclic-universe, or holographic ensemble would likely be empty or incapable of supporting life, governed by chaotic or sterile laws. This tension lies at the heart of the controversy about whether multiverse explanations genuinely reduce the need for any further explanation of fine-tuning, or whether they too require some deeper principle to account for the existence of life-permitting regions. Within this context, philosophers and theologians (Barnes, 2012; Craig, 2003; Leftow, 2012; Swinburne, 2004) argue that there remains conceptual space for a Creator who grounds the existence and structure of either a single universe or a multiverse, while other authors (Dawid, 2013; Ellis and Silk, 2014; Ikeda and Jefferys, 2006) contend that the appeal to a divine cause introduces explanatory

[7] Regarding the questions related to infinity, see Barrow (2005), Heller and Woodin (2011), and Rucker (1984).

elements that are difficult to integrate with the methodological standards of physics. Thus, when one connects fine-tuning, multiverse scenarios, and theism, it is important to distinguish clearly between empirical questions about which cosmological model best fits the data and philosophical questions about which kinds of ultimate explanation are acceptable or necessary.

To understand who or what "God" might be in such discussions, we must consider a wide range of possibilities often explored in the philosophy of religion and speculative cosmology. God could be conceived as the origin of the universe, the multiverse, a cyclic universe, or a universe born "from nothing," or even—under more unorthodox hypotheses—as a being that emerged through some evolutionary process in another universe. Simultaneously, if a primordial energy core were the primary cause of the cosmos and there were nothing "before" the Big Bang in physical terms, a Creator's possible "emergence" immediately after the implosion, that is, during the Planck era, has sometimes been entertained in philosophical speculation. However, such scenarios go beyond standard empirical science and should be understood as conceptual possibilities rather than as consequences drawn directly from current physical theories. Another crucial consideration is whether a possible God could also intervene during the evolution of the cosmos. During the earliest phases of cosmic history, a series of extraordinary processes occurred. Within the first three minutes, the "superforce" separated into gravity, electromagnetism, and the weak and strong nuclear forces. The universe underwent dramatic expansion, likely through an inflationary phase. Elementary particles such as quarks, protons, electrons, and atoms were formed, and primordial nucleosynthesis enabled the formation of hydrogen and helium (Weinberg, 1977). Subsequently, over millions of years, thanks primarily to gravitational forces, the elements formed in the first three minutes came together to form the first galaxies and stars. At the end of their life cycle, many of these stars perished or exploded as supernovae, releasing chemical elements vital for the formation of new generations of galaxies and stars. In the first three minutes and over millions of years thereafter, these processes unfolded systematically, laying the groundwork for life on planets. Consequently, studying the Big Bang phases raises questions regarding the fine-tuned universe and the apparent "remarkableness" of a sequence that leads from an early hot plasma to a universe rich in complex chemistry (Davies, 2007; Hogan, 2000). Philosophically, this invites debate on whether such apparent directedness toward complexity is adequately captured by purely statistical and dynamical accounts, or whether it suggests deeper teleological or design-like features.

The uniqueness of Earth and our solar system must also be considered. Earth orbits within the so-called habitable zone: not too hot and not too cold, ideally suited for

sustaining liquid water, the fundamental ingredient of life as we know it. Moreover, its nearly circular orbit ensures it remains within this habitable zone. Other crucial factors for life on Earth include Jupiter, which intercepts many asteroids, and the Moon, which stabilizes Earth's axial rotation (Lewis and Barnes, 2016). These conditions are often cited in discussions of the "rare Earth" hypothesis, which maintains that complex life may be extremely uncommon in the cosmos (Gribbin and Rees, 1989; Ward and Brownlee, 2000). Critics (Bostrom, 2002; Lineweaver, 2001; Scharf, 2009), however, caution against strong conclusions, noting observational selection effects and the still limited sample of known planetary systems. When discussing the origin and evolution of life, fine-tuned processes at smaller scales must also be recognized. Hoyle (1959) noted that the laws of nuclear physics seemed "designed" with consequences for stars in mind. Life on Earth emerged through regulated chemical processes that resulted in the birth of the primordial cell. Currently, two principal families of theories aim to explain the origin of life on Earth. The first suggests that life arose through chemical processes on Earth around four billion years ago (Bernal, 1951; Haldane, 1929; Oparin, 1924). Contemporary origins-of-life research details complex scenarios involving self-assembling lipids, autocatalytic reaction networks, and RNA or RNA-like polymers as possible early informational molecules, as well as the central role of bioenergetics in driving prebiotic chemistry (Deamer and Weber, 2010; Ruiz-Mirazo et al., 2014; Szostak, 2012). The second family of theories, panspermia (Wickramasinghe, 2011), holds that life, or its basic building blocks, originated in space and arrived via cometary or meteoritic impacts, bringing fundamental elements for the primordial cell. In both approaches, the origin of life is understood as the result of precise, highly constrained chemical and physical processes, although there is considerable scientific controversy about where, how, and how often life can arise, and whether biochemical fine-tuning supports broader teleological readings (Cleland, 2019; Davies, 2007; Fry, 2000).

A similar logic applies to life's evolution. Over the past 500 million years, billions of species formed through Darwinian evolution (Darwin, 1859), where natural selection tends to preserve those organisms best adapted to their environment, while those that do not adapt perish. Dawkins (2006) emphasizes that the sponge Euplectella aspergillum, the plant Aristolochia trilobata, the giant sequoia Sequoiadendron giganteum, and chlorophyll-based photosynthesis evolved through processes that are highly calibrated by local environmental conditions and genetic constraints. Philosophically, evolution introduces additional questions: whether evolutionary processes are purely contingent and blind, or whether there are convergent trends (e.g., toward complexity, intelligence, or consciousness) that might be interpreted as "directional," and how such trends—if real—should be reconciled with either a theistic or a purely naturalistic worldview (Ayala,

2007; Morris, 2003; Ruse, 2010). Another important issue related to evolution concerns consciousness[8]—the difficulty in understanding why humans possess an awareness that allows them to think, feel, and interpret the reality around them. This consciousness might also belong to many other beings who have lived, are living, and will live on Earth. The debate involves, among others, Chalmers (1995), who formulates the "hard problem" of consciousness, Dennett (1991), who defends a broadly physicalist and functionalist account, and Nagel (1974, 2012), who argues that subjective experience poses challenges to reductive physicalism. The hard problem of consciousness has been taken by some authors (Chalmers, 1996; Nagel, 2012) to suggest limitations in our current physical theories, while others (Churchland, 1986; Dennett, 1991) argue that it can eventually be accommodated within physicalism. This debate intersects with fine-tuning and cosmology when authors propose that minds, or information-bearing structures more generally, play a fundamental role in the universe (Davies, 2007; Wheeler, 1990). It is important to remember that the stages of the Big Bang, the formation of the solar system and Earth, the origin and evolution of life, and the emergence of consciousness developed because of a series of precise laws—such as gravity—that were not logically destined to originate from the Big Bang itself. These laws were fundamental for the realization of each of these processes. Thus, any philosophical interpretation—whether theistic, deistic, or naturalistic—must grapple with both the apparently contingent character of these laws and the fact that we only ever directly observe one realized cosmos.

One possible approach that addresses the enigma of life on Earth is the anthropic principle (Barrow and Tipler, 1986; Carter, 1974). This philosophical and methodological concept asserts that the universe must have the characteristics it possesses in order for conscious life capable of observing these features to exist. In other words, if we humans exist and can observe the universe, it is because the conditions of the universe were such as to permit our existence. In its weak form, the anthropic principle is often taken as a selection effect: among all regions or universes (if there are many), we can only find ourselves in one compatible with our existence. In its stronger forms, it has been interpreted as suggesting that the universe is in some sense compelled or oriented toward producing observers (Barrow and Tipler, 1986; Leslie, 1989). The anthropic principle, by itself, does not preclude the presence of a divine being. A Creator could be hypothesized to have set the initial conditions, the laws, or both, so as to make a life-permitting universe highly probable or even inevitable (Craig and Sinclair, 2009; Swinburne, 2004). At the same time, a number of philosophers and cosmologists (Bostrom, 2002; Ellis, 2007; Ikeda

[8] For topics related to consciousness, see Chalmers (1996), Dennett (1991), Hameroff and Penrose (2014), Penrose (1989, 1994), Schneider and Velmans (2017), Searle (1997), and Seth (2021).

and Jefferys, 2006; McGrew et al., 2001) argue that anthropic reasoning, together with multiverse hypotheses, can offer non-theistic accounts of why we should not be surprised to find ourselves in a fine-tuned universe, and that such accounts weaken or neutralize traditional design arguments. The limitation of the anthropic principle, however, is that it does not provide a causal explanation for why the universe possesses these specific characteristics. In its weak form, it risks being merely a restatement of the fact that we can only observe conditions compatible with our existence. It does not address the deeper question of why the global structure of physical reality—whether a single universe or a multiverse—is such that life-permitting domains exist at all. Consequently, many authors (Bostrom, 2002; Ellis, 2007; Rees, 1999) consider it more as a methodological constraint on our reasoning than as a significant contribution to ultimate explanation in cosmology and philosophy. This limitation raises questions about how and why the conditions of the universe came to be this way, and leaves open, among other possibilities: purely physical explanations yet to be discovered, multiverse-based accounts combined with selection effects and non-trivial measure-theoretic assumptions (Garriga and Vilenkin, 2008), and the hypothesis that the universe is in some sense intended or designed for life. Philosophically, the status of the anthropic principle therefore remains contested: several authors defend its role as an indispensable heuristic in cosmology and as a constraint on theory construction (Bostrom, 2002; Rees, 1999), while others argue that it is explanatorily thin unless embedded in a richer theoretical framework, such as specific multiverse models or accounts of fundamental physics (Hogan, 2000; Smeenk, 2013).

Finally, I consider the ultimate fate of the universe[9]. Multiple theories address this issue, including the Big Freeze (Thomson, 1882), which suggests that, in trillions of years, the cosmos will become a dark and cold place where life will ultimately perish. By contrast, the Big Crunch (Friedman, 1922) proposes that at some point the universe's expansion will cease and the cosmos will contract again, ultimately returning to a gravitational singularity reminiscent of the Big Bang. Other theories—such as the Big Rip (Caldwell et al., 2003), Big Decay (Leslie, 1996), Big Brunch (Kiefer and Zeh, 1995), and Big Hit (Starobinsky, 2000)—posit that, in billions of years, spacetime itself could rupture or undergo radical transformation. The Mars–Senovilla–Vera model (Mars et al., 2007) even suggests that time could eventually entirely cease. These scenarios illustrate not only the limits of our current empirical knowledge but also deeper philosophical questions about whether time, entropy, and cosmic "beginning" and "end" are features of reality itself or dependent on the particular theoretical framework adopted. Science suggests that human civilization may eventually face extinction. However, a potential escape has been

[9] Works by Davies (1994) and Mack (2020) highlight most of the hypotheses about the end of the universe.

envisaged in speculative discussions: the progressive enhancement of our capacities through technology, perhaps to the point where our influence on cosmic processes becomes non-negligible. If humanity survives over the next billion years (which current physics does not inherently forbid), it could dramatically extend its control over matter, energy, and information, thereby reshaping aspects of its cosmic environment. The likelihood of this occurring depends primarily on technological development, which is destined—barring catastrophe—to become ever more significant in our lives. In the future, technological advancements may be applicable to the universe itself, at least locally or within certain causal domains. Human civilization, billions of years from now, might acquire technological resources sufficient to radically improve its prospects for long-term survival and to mitigate some threats associated with specific cosmic end scenarios.

Philosophically, these possibilities invite comparison with attributes traditionally ascribed to God in classical theism, such as omnipotence and omniscience. It is important, however, to distinguish carefully between maximal capacities realizable by finite agents within given physical laws and constraints, and the absolute, unlimited attributes usually associated with a divine being. Even a civilization that could manipulate vast regions of spacetime would remain, in principle, constrained by the underlying laws of physics, by its location in the causal structure of the universe, and by its own contingent origin. Thus, while future humans (or their descendants) might acquire powers that are "god-like" relative to our current condition, these would still differ conceptually from the traditional notion of an omnipotent, omniscient, and necessary deity. Consequently, the universe might become increasingly subject to human (or post-human) agency, and humanity, through its technological discoveries, could acquire faculties reminiscent of those attributed to God in some religious traditions—for example, the ability to engineer environments, perhaps even to initiate new cosmic domains, or to indefinitely preserve conscious life. Yet such scenarios should be understood as speculative extrapolations grounded in current discussions about technological trajectories and the physical limits of computation, rather than as predictions mandated by existing science. They also raise ethical and metaphysical questions: whether possessing great power entails corresponding moral responsibilities and whether finite beings could ever fully transcend the contingency and vulnerability that characterize creaturely existence.

In principle, the ideas explored in this section are not necessarily exclusive to the human species. If other intelligent species exist (Webb, 2015), they will likely contemplate analogous questions. Extraterrestrial civilizations, like humans, may debate the existence of God or gods based on their universe's physical laws and unique features.

Elements such as universal constants, the Big Bang (or its analogues in their cosmological models), and the origins of life can prompt intelligent species to ask whether their existence has a divine, naturalistic, or hybrid explanation. Even in universes or cosmic regions with different laws, such beings might ponder whether some higher-level agency influenced their existence, as their creation processes would remain, from their perspective, remarkable and in need of interpretation. Regardless of their universe, such beings might also imagine becoming divine themselves in a derivative sense. Through advanced technology or as-yet-unknown processes, they could explore ways to avoid their universe's end, to preserve or replicate consciousness, and to exercise extensive control over matter and information, thereby perceiving themselves as "deities" of their own cosmic domains. Whether one interprets these developments as approximations to the divine, as natural outgrowths of intelligent life, or as ethically and metaphysically problematic forms of self-deification remains a central philosophical question at the boundary between cosmology, technology studies, and the philosophy of religion. A further conceptual possibility is the existence of a plurality of gods or god-like agents. No current scientific theory logically rules out the hypothesis that the physical laws, universal constants, or life itself were established by a collective of powerful agents who jointly configured them so as to generate life in the cosmos or on Earth. At the same time, from a philosophical standpoint, such hypotheses confront many of the same issues as single-deity models: questions about the ultimate origin of these beings, the explanatory gain achieved by positing them, and the criteria by which such explanations are to be assessed in relation to purely naturalistic accounts.

In summary, this section has examined the intersection between contemporary cosmology and philosophical–theological reflection by considering the universe's origin, the origin and evolution of life, the emergence of consciousness, and the possible end of the cosmos. Throughout, the focus has been on the status of physical laws and constants, the fine-tuning problem, and the various explanatory strategies—naturalistic, theistic, and hybrid—that have been proposed. While scientific theories about the Big Bang, multiverses, cyclic models, and ultimate cosmic fates continue to evolve, they inevitably give rise to further questions about contingency, necessity, and purpose—questions that, at least for now, keep open a conceptual space for ongoing dialogue between science, philosophy, and theology.

3. Scientific and philosophical hypotheses regarding the existence of God: An investigation from different perspectives

Several scientific theories propose multiple gods or a God. The laboratory-created universe hypothesis suggests that our cosmos emerged from an experiment by an extraterrestrial civilization aiming to create a livable universe. Harrison (1995) supports this thesis. Origin-of-life research also explores whether a Creator established life. Crick and Orgel (1973) proposed directed panspermia, which suggests that life originated on Earth owing to alien intervention, either directly or via spacecraft, to create the necessary chemical processes for the primordial cell. Directed panspermia remains debated but has not been ruled out as an explanation for life's origin. Other hypotheses about a God relate to the nature of our reality, which unknown beings may govern. Significant theories include the simulated universe, brain-in-a-vat, and Boltzmann brain scenarios. The simulated universe concept (Bostrom, 2003) posits that advanced past civilizations could create computer simulations of universes. Thus, our cosmos might be a simulation running on the computer of an alien civilization. This idea has substantial implications about the nature and limits of reality. Different types of simulation may exist, such as creating an entirely simulated universe or simulations confined to specific objects, such as computers, mobile phones, or televisions. A similar hypothesis—referred to as brain-in-a-vat—was conceptualized by Putnam (1981), who proposed that a mad scientist could have extracted a person's brain, placed it in a vat of nutrient-rich fluid, and connected it to a supercomputer. The entity in the vat would live a life believing it to be real, when in fact it would be nothing more than a fictional reality created by the scientist. This hypothesis raises the possibility that each individual in human civilization may be nothing more than a brain in a vat created by a mad scientist or an unknown entity from another universe. A related concept is Austrian physicist Ludwig Boltzmann's brain hypothesis. The Boltzmann brain is a hypothetical sentient entity that emerges from quantum fluctuations in chaos. This entity would then create a reality similar to the one we experience in order to avoid existing in an empty space dominated by nothingness (Dyson et al., 2002). This process could occur multiple times, giving rise to numerous Boltzmann brains. Thus, each individual in human civilization may be nothing more than a brain that has created our reality to experience a richer and less monotonous existence.

Thus far, I have described the possibility that a scientific God or gods may have created the universe, engendered life, or altered reality. However, multiverse theory introduces the possibility of all types of gods existing, whether scientific, religious, or philosophical. Tegmark (2014) and Greene (2011) theorize the possibility of different types of multiverses. Tegmark proposes four levels of multiverse, while Greene identifies nine. The most relevant categories of multiverses for our discussion include Tegmark's four-level multiverse, in which universes with different physical laws exist, and Greene's extreme multiverse, in which all possible types of universes exist. In Greene's extreme

multiverse, any universe with a non-zero probability of existing will manifest. This suggests the possibility that all types of gods, whether those of religious traditions or philosophical constructs, will inevitably develop somewhere within the multiverse if they have a non-zero chance of being created. Such a multiverse could include universes dominated by the Christian, Islamic, or Jewish God or deities from Eastern religions, as well as a deistic, pantheistic, pandeistic[10], or maltheistic[11] God, Hoyle's (1983) superintelligence, Descartes' (1641) malevolent demon, or Plato's demiurge (Brumbaugh and Wells, 1968). Simultaneously, universes created by gods worshipped by the Greeks, Romans, Egyptians, Germanic peoples, polydeists[12], or neopagans could exist. Furthermore, both monotheism and polytheism might exist in Greene's multiverse through natural processes or intervention. Universes could emerge from precise physical processes or be created by an alien civilization, mad scientist, or Boltzmann brain. Despite a lack of scientific support for the gods of religions and philosophies in this multiverse, they could still exist. Tegmark's four-level multiverse theorizes universes with varied physical laws, potentially enabling the emergence of these gods. Furthermore, unimaginable scientific gods could arise in both multiverses. Some universes might feature a scientific God from the Planck era or a God ruling purely with evil or irrationality. Such multiverse theories suggest an infinite variety of gods with unique traits.

In these contexts, talk of "gods" or "scientific deities" is often best understood in a metaphorical or analogical sense. Hypothetical agents who create universes in laboratories or run vast simulations may possess capacities that are maximal relative to their own technological and physical context, yet they would still be finite beings acting within some overarching framework of laws and constraints. Philosophically, this contrasts with the traditional attributes of a classical theistic God, usually characterized as absolutely omnipotent and omniscient—able to do anything that is logically possible and knowing all truths, including counterfactuals and timeless propositions. By comparison, even the most advanced universe-creating civilization would at most display "maximal power" and "maximal knowledge" within a given set of laws. Hence, invoking future or extraterrestrial civilizations as "god-like" should be read as an analogy that

[10] Pandeism is the hypothesis that God created the universe but subsequently became one with the cosmos.
[11] Maltheism, on the contrary, asserts that God is not an infinitely good being but rather an evil, cruel, and arrogant Creator whose aim is to make people suffer.
[12] Polydeism shares common grounds with deism, which posits that God created the universe but ceased to intervene immediately after its formation. The distinction between the two concepts is that, while deism proposes that a single God generated the cosmos, polydeism suggests that a group of gods formed the universe without intervening in its processes after it was created.

highlights extreme but still limited capacities, not as an identification with the absolute attributes central to many religious traditions. This possibility raises questions about utilizing past concepts of God to solve universal mysteries, particularly because our universe originated from precise physical processes leading to structured laws and constants of life. The same reasoning can be applied to the origin of life and evolution of species, where the processes that resulted in the emergence of the primordial cell, numerous living species, and human consciousness were highly ordered. Responses to these mysteries may involve scientific, philosophical, or religious theories about God. However, limitations must be acknowledged; for example, laboratory-created universes and directed panspermia are restricted to explaining the universe's origins and life. By contrast, concepts like simulated universes, the brain-in-a-vat, and Boltzmann brains address the entire universe, from inception to end. We cannot dismiss the possibility that we live in a universe created by a deistic God or the Christian God, especially if we exist within a universe shaped by such a deity owing to multiverse randomness.

Similar reasoning applies to extraterrestrial civilizations that could inhabit other universes with comparable physical laws. Strictly from a scientific perspective, theories like laboratory-created universes and simulated realities would also interest extraterrestrials. They might not study only those gods specific to human religions. Conversely, instead of focusing on our religious gods, extraterrestrials might consider their own historic beliefs as valid within the multiverse. If they exist under different physical laws, they might possess religions beyond our understanding. Yet, they would not overlook the idea of scientific deities beyond our imagination that enabled their existence. Finally, the philosophical concept of infinity warrants discussion. If concepts like laboratory-created universes and simulated realities are valid, questioning the origin of the civilization or scientist behind our universe becomes crucial. This leads to the paradox of infinite regression, where each universe is spawned by another civilization or scientist from a different cosmos, continuing the past indefinitely. The same reasoning may be applied to the present and future. In this case, the resulting paradox would be that of infinite replication. At this very moment, an infinite number of civilizations or scientists would exist, creating simulated or laboratory universes. Furthermore, this process would continue infinitely. The above conclusions also apply, albeit with slight variations, to the possible existence of the God of religions, philosophers, or Boltzmann brains. If these models of God are considered the primary cause of the universe they created, then an infinite number of prior gods would exist, formed in the infinite past, present, and future of the multiverse. The paradox of infinite regression and replication does not exclude the possible existence of all types of God or gods described, as no physical or mathematical law prohibits the possibility of infinite regression or infinite

current and future replication associated with the presence of one or more Creators within the multiverse.

4. Becoming gods: Future scenarios for humanity and extraterrestrial civilizations

Another significant issue concerns the possibility that humankind or an alien species may someday attain a god-like status. Shermer (2002, p. 33) asserts that "any sufficiently advanced extraterrestrial intelligence is indistinguishable from God." This statement does not exclude the possibility that our species or extraterrestrials may one day acquire seemingly divine attributes through technological advancement. From this perspective, several scientific theories explore the prospect of humankind one day attaining divine abilities. Among the most renowned of these theories is that of technological singularity. Kurzweil (2005) argues that technological progress surpasses human predictive capabilities. He describes six epochs in human evolution, with the sixth being particularly intriguing: in this stage, the universe "awakens" as human intelligence expands across the cosmos. This sixth epoch introduces unprecedented scenarios, as humanity will have acquired technologies so advanced that they will appear to confer powers and knowledge far beyond current human limitations. Loosely, such a civilization might be described as "omnipotent" or "omniscient." However, conceptually, it is important to distinguish between capacities that are maximized within a fixed set of physical laws—such as the ability to manipulate matter and energy on cosmological scales or to access and process enormous amounts of information—and the absolute attributes traditionally associated with the divine in many religious traditions. Classical omnipotence is usually understood as the ability to realize any logically possible state of affairs, unconstrained by antecedent physical laws, while classical omniscience is taken to involve infallible knowledge of all truths, including timeless, counterfactual, and future contingents. Even in the most optimistic technological scenarios, a future civilization would remain bound by whatever laws of nature obtain; its power and knowledge would therefore be maximal only relative to those laws, not unlimited in the strong, metaphysical sense implied by classical theism. A similar argument can be made regarding the Kardašëv Scale, a method for classifying civilizations based on their level of technological advancement, developed by Russian astronomer Nikolai Kardašëv (1964). Barrow (1998) suggests that up to seven types of civilizations can be identified and asserts that in the seventh type, a future human civilization may be able to modify spacetime structures. Upon reaching this stage, humanity would become a "deity-like" agent, as it could alter the fabric of the universe according to its will within the constraints of the governing physical principles.

Another type of divinity is associated with the concept of the Omega Point, a concept theorized as early as the 19th century. Hegel (1807) emphasized that humanity will one day witness the rise of a spirit ascending toward a final point where absolute knowledge will be attained. Similarly, Peirce (1931–1958) argues that the universe evolves from an initial state of pure chaos to a final point in which a singular consciousness will permeate the entire cosmos. The Omega Point concept was further developed in the 20th century, mainly by Teilhard de Chardin (1955) and Tipler (1994, 2007). The French Jesuit Teilhard de Chardin published various writings claiming that human evolution is progressing toward an ultimate destiny called the Omega Point, where a transcendent God will emerge. Tipler echoes this thesis, asserting that our civilization will acquire divine faculties through the Omega Point shortly before the occurrence of the Big Crunch. Teilhard de Chardin and Tipler's hypotheses differ in the physical process through which the Omega Point will be accomplished. According to the Jesuit hypothesis, the Omega Point will occur naturally, whereas Tipler hypothesizes that it will be achieved through simulation. All aforementioned ideas are based on the assumption that we will become akin to God. Yet, again, there is an important conceptual distinction: in Teilhard de Chardin and Tipler's models, "divinization" may involve an ultimate unification or maximalization of consciousness and informational capacity, but this does not straightforwardly imply the possession of unqualified omnipotence or omniscience in the strong, classical sense. Rather, the envisaged "god-like" state is tied to particular cosmological dynamics (such as a final singularity or an asymptotic evolutionary limit) and remains conceptually dependent on the structure of the cosmos itself. At this stage, recall that the assumptions from section 2, suggesting that extraterrestrial civilizations created the universe or life, may apply to humanity. Through advancing technology and consciousness, humans could influence life creation or new universes, developing divine faculties. Future humans may create universes in a lab, generate new life forms, or initiate primordial cell formation on other planets through directed panspermia. Additionally, future humanity might develop simulated universes in computers or devices, impacting inhabitants' lives. In the distant future, a mad scientist could also submerge multiple brains in a vat, allowing individuals to experience a false reality.

The end of the universe is another crucial consideration. As discussed in section 1, theories on the universe's end predict the extinction of life and intelligent species. However, technology and evolving consciousness may offer a different outcome. Technological singularity, the Barrow scale, various Omega Points, and creating simulated or lab-born universes could help humanity escape this dark fate. These theories offer varied approaches to the cosmos' end. A technological singularity could permit the construction of time machines to prevent natural processes from leading to the universe's

demise. Accessing the seventh level of the Barrow scale might enable humanity to modify spacetime structure and create new physical laws to prevent cosmological destruction. The Omega Points theorized by Hegel, Peirce, Teilhard de Chardin, and Tipler could be pivotal mechanisms for avoiding the universe's end. The highest consciousness complexity level could allow civilization to survive beyond the cosmos' demise. According to Teilhard de Chardin, this occurs through transcendence, while Tipler suggests that the ultimate gravitational singularity of the Big Crunch could play a vital role. Furthermore, creating simulated and laboratory universes would offer an alternative pathway for continued existence. Through a wormhole[13], a future human species might migrate to a newly laboratory-created universe or simulated universe and thus continue to exist. All these processes are highly significant, as they could render our species akin to a God endowed with extraordinarily extensive abilities. Nonetheless, even in such scenarios, humanity's power and knowledge would remain conditioned by some overarching framework of physical or informational constraints. For this reason, it is more precise to speak of "god-like" or "quasi-divine" capacities—indicating extreme but still finite powers—rather than to equate a future civilization straightforwardly with a being that is absolutely omnipotent and omniscient in the sense central to many classical doctrines of God.

The same reasoning applied to the possibility of extraterrestrials believing in God can be extended to whether their species might one day attain divine status. As the theories concerning deification are scientific, it is plausible that extraterrestrial beings would consider acquiring god-like abilities through technological singularity, the Barrow scale, or the Omega Point, whether in this universe or in others governed by similar physical laws. Similarly, with abilities developed over millions or billions of years, they might become capable of creating laboratory or simulated cosmoi, placing extracted brains in vats, or even exporting life to other planets through directed panspermia, thereby acquiring divine faculties in the weaker, physically maximal sense just described. The reasoning mentioned in section 3 about God as the creator of the universe or life applies here as well. It raises the question of whether extraterrestrial beings, formed under different physical laws, could one day attain god-like status. In universes governed by physical principles distinct from our own, possible alien species might develop unknown processes that enable them to achieve divinity—processes beyond human comprehension yet scientifically feasible within their respective physical laws. When considering the hypothesis of becoming god-like through technological singularity—for example, the Barrow scale, the Omega Point, and the creation of laboratory or simulated universes—

[13] Einstein and Rosen (1935) were the first physicists to study the possible existence of wormholes.

these concepts can be connected to the philosophical notion of eternity. Indeed, if extraterrestrials or the human species in the distant future were to master time travel through the construction of time machines[14], they could theoretically repeat this process ad infinitum, thereby perpetually avoiding the universe's ultimate fate. By contrast, the eternity associated with the Omega Point differs fundamentally, as it would be attained in a transcendent or immanent realm beyond the cosmos, eliminating the need for cyclically using a time machine to evade the death of the universe. A more complex concept of eternity emerges in the Barrow scale and in laboratory-created or simulated universes. In these scenarios, much would depend on whether it is possible to modify physical laws or create universes free from cosmic termination. If human or alien civilizations can inhabit a universe where such extinction processes do not occur, a simple adjustment to the laws of nature or the creation of a stable cosmos would be enough for eternal existence. On the contrary, if every universe is destined to end, these species would be forced to continually revise physical laws or build successive laboratory or simulated universes to maintain their eternal existence.

5. Means and methods for investigating the existence of God or gods

At this point, it is important to ask whether the theories previously proposed regarding the possible existence of God could one day be confirmed or refuted. One approach to assessing the existence or non-existence of God involves the concept of probability, encompassing both formal accounts of chance and inductive inference and more qualitative judgments about plausibility (Hacking, 2001; Jaynes, 2003; Kolmogorov, 1950; Swinburne, 2004). Throughout what follows, "probability" and "improbability" are thus to be understood in this broad sense unless otherwise specified. In some contexts, "improbable" will be used qualitatively, to indicate processes that appear highly unexpected or finely constrained against an appropriate background of possibilities; in others, probabilistic language suggests that, in principle, one could assign quantitative measures within a more explicit probabilistic framework, even if current science does not yet allow for robust numerical estimates. Regarding the universe's origin, the phases of the Big Bang, life, and the evolution of species, Aczel (2014) maintains that the improbability of certain processes occurring is truly striking. If the physical laws, universal constants, or phases of the Big Bang had been even slightly different, the universe would have imploded or exploded billions of years ago. A similar line of

[14] According to Davies (2002), the feasibility of time travel, whether into the past or future, is scientifically supported.

reasoning applies to the origin of the Earth, the emergence of life, and the evolution of species. If the processes that led to the birth of the primordial cell and of consciousness had been even marginally different, humanity would never have existed. In these discussions, "improbability" should not be understood as a precise numerical claim based on a well-defined probability distribution over all possible universes but rather as an expression of how delicately constrained these processes appear in light of current physical and biological theories. If, in the future, it was shown—on the basis of a well-specified probabilistic framework and appropriate cosmological models—that, in a multiverse or cyclic-universe scenario, a large fraction of universes is suitable for life, this would significantly strengthen the case for a theistic explanation, on the assumption that it would be difficult to understand how life-friendly conditions arise so frequently without a deeper explanation.

The same kind of reasoning could be applied to the case of a single universe. The existence of just one cosmos, originating from a primordial energetic nucleus with physical laws and universal constants favorable to life, could be interpreted as evidence of God's existence. Moreover, if the processes that occurred on Earth—currently regarded as highly "improbable" in a qualitative sense—were common in the cosmos, this too could be read as further support for the hypothesis of a Creator. In all cases, such claims would be warranted if, within an appropriate probabilistic model, such a configuration were judged to have a very low prior probability. As for identifying which God or gods might exist, some insights may be derived from the information available in the cosmos and on our planet. Our universe, like other universes, is governed by information (Lloyd, 2006; Seife, 2007; Wheeler, 1990). Physical laws, universal constants, equations, and initial parameters all comprise a code that has enabled the occurrence of all physical processes throughout the history of our universe. The same principle applies to life: the primordial cell and human genome contain information essential for governing physical processes associated with life and consciousness. Through the study of information within the universe and life itself, it may be possible to determine whether our universe is a simulation, whether it was created in a laboratory, whether we are brains in a vat or representatives of Boltzmann brains, or whether life on Earth was created by an alien civilization. Furthermore, mathematics may assist us in understanding whether the spacetime of the cosmos and the information contained within it follow a precise code, which could be construed as a certain type of God or as evidence of a more general informational structure underlying reality. Simultaneously, it cannot be excluded that information relating to the universe and the Earth could confirm or refute the existence of any form of God, in the sense that future discoveries might either point

toward patterns suggestive of intentional design or instead support a picture in which all observed regularities admit fully naturalistic explanations.

Regarding the hypothesis of God's existence, studying the mathematics of the cosmos' spacetime will be essential. Hsu and Zee (2006) suggest that the cosmic microwave background offers a remarkable opportunity for an eventual Creator of the universe to send messages to its inhabitants, using Lagrangian mathematics. Furthermore, Broadbent (2023) proposes an equation similar to the well-known Drake Equation, composed of 15 factors, which represents the probability that intelligent life in a prior universe initiated our cosmos. This equation can serve as a structured thought experiment to help identify key factors related to the origin of our universe and facilitate the examination of each, with the aim of exploring whether our universe was intentionally created by God or an advanced civilization. Once again, the relevant probabilities here are best understood as model-dependent tools for organizing uncertainty and comparing hypotheses, rather than as precise and final measures of how likely divine creation is in an absolute sense. Thus, mathematics may play a decisive role in assessing whether the cosmos displays signatures that are more naturally interpreted as the product of design, simulation, or laboratory creation, or as the outcome of impersonal physical processes.

Additional means of investigating the existence or non-existence of God may arise from technological advancements, human evolution, and contact with alien civilizations. The development of technology will be crucial in enhancing our intellectual capabilities, unveiling the secrets of the cosmos, and refining our assessments of competing hypotheses about a deity. For example, by constructing highly advanced computers and robots, artificial intelligence (Luger and Stubblefield, 2004; Rich et al., 2010; Russell and Norvig, 2021) could become a valuable ally in addressing questions regarding the existence of God. Another possibility could involve implanting microchips in the human brain or transforming humans into super-intelligent cyborgs (Clark, 2004; Gray, 1995; Mann and Niedzviecki, 2001) who, with their immense cognitive capacities, might be better equipped to evaluate large bodies of data, complex models, and subtle philosophical arguments related to the deity hypothesis. The final avenue for exploring the question of God's existence may arise from contact with extraterrestrial civilizations. Vinge (1993) argues that extraterrestrial civilizations could reach technological singularity, while Smart (2012) emphasizes that, in the future, aliens might transcend the spacetime of the cosmos. These approaches lead to the conclusion that any potential alien civilizations in the universe would likely possess advanced intellectual and technological capabilities, enabling them to understand the structure of the cosmos and our place within it.

Should we establish communication with alien civilizations in the future, they could be highly advanced and may have already developed sophisticated views on fundamental questions regarding God. They might, for example, have articulated and tested theories about whether we are part of a simulation, the product of a laboratory experiment, brains in a vat, or representatives of Boltzmann's brain or whether life on Earth emerged through directed panspermia. Moreover, extraterrestrials could offer insights into whether our species has the potential to become "like God" by achieving something analogous to an Omega Point or the seventh level of the Barrow scale. Importantly, such scenarios should be understood, conceptually, in terms of approaching maximal power and knowledge permitted by the physical laws of a given cosmos. Even if aliens were to share technologies that vastly enhance our capacities, they would not thereby confer absolute omnipotence or omniscience in the classical theological sense. Rather, they might help us realize extremely advanced but still law-bound forms of agency and understanding. The search for extraterrestrial intelligence program can also be connected to the thesis presented in this section. It continues to play a crucial role in the search for intelligent life in the universe (Montebugnoli et al., 2022). If the hypotheses of a vacuum universe or a holographic universe—which propose the existence of a single universe—are valid, then an immanent God could be present within our cosmos. Consequently, a research project similar to the search for extraterrestrial intelligence program, but aimed at discovering a Creator in the universe through the construction of highly advanced radio telescopes or analogous instruments, might be conceived as a way to search for signatures of such a being at a specific point in spacetime or encoded in large-scale structures. From such an analysis, we could also gain insights into the physical or biological processes that might, under these speculative models, constitute God.

To conclude, agnosticism must be applied to the hypothesis of a deity and the possibility of humanity one day becoming like God. Dawkins (2006) distinguishes between two types of agnosticism. The first, termed temporary pragmatic agnosticism, pertains to the suspension of judgment concerning a natural mystery that has a valid answer yet remains undiscovered by humankind. The second, termed permanent theoretical agnosticism, applies to enigmas that will never be resolved owing to the lack of evidence confirming or refuting them. Temporary pragmatic agnosticism should be applied to the issues discussed in this chapter. We do not presently know whether scientific theories regarding the possible existence of God or a future "god-like" humanity are true or false. The study of mathematics, probability, and cosmic information, combined with technological advancements and potential contact with extraterrestrials, could help us refine our assessment of these hypotheses.

6. Conclusions

The question of God's possible existence or non-existence remains unresolved. Unlike Hawking and Mlodinow (2010), Dawkins (2006), and Krauss (2012), who deny the possible existence of a Creator, the study of the universe's origin, the theory of everything, the solar system, the origin of life, and the evolution of species does not exclude the possibility of a specific type of deity's existence. At the same time, the available scientific evidence does not compel such a conclusion, but rather leaves open a range of interpretations involving God, the denial of God, and agnosticism. Furthermore, unlike the doctrines of established religions that reject the idea that humans can become like God, human civilization, supported by technological advancements, may in principle develop faculties that appear "god-like" relative to our current condition. Such faculties, however, would be better understood as approaching the maximal powers and knowledge permitted by the laws of nature, rather than as conferring absolute omnipotence or omniscience in the classical theological sense. Theories concerning what preceded the Big Bang and the ultimate fate of the universe do not negate these previous observations about the potential existence of a deity or the possibility of humanity acquiring quasi-divine faculties. For example, the idea of a multiverse or cyclic universe does not diminish the significance of our universe, particularly when considering the unique physical laws that govern it. This perspective suggests that our universe could be part of a broader cosmic context that still holds its importance. Conversely, theories about the eventual end of the cosmos, even those predicting the cessation of life, do not necessarily preclude the possibility that advanced technology could enable humanity or other intelligent species to mitigate, postpone, or partially reshape their cosmic fate. Notably, no physical law explicitly excludes the possibility of not only one God but also a plurality of gods, and it is conceivable that discussions regarding the potential existence or non-existence of a deity may likewise be ongoing among alien species.

In this essay, I have highlighted scientific theories that hypothesize the existence of a God or gods or that predict the potential for human or alien species to become god-like. The hypotheses of a laboratory-created universe, directed panspermia, simulated universe, brain-in-a-vat, and Boltzmann brain indeed include the possibility of intervention by powerful agents—whether described as "gods" or advanced civilizations—at specific points in the history of our universe. The God conceived by established religions or philosophers cannot be dismissed either, as universes in which such a deity emerged or acts may exist within a multiverse. I have also highlighted the philosophical and scientific aspects of the question of a deity's existence. This consideration leads to the argument that, in the past, another deity could have created

every deity, while in the future, we might engender new types of "deities" through processes that could in principle repeat without bound, such as infinite regression and replication. These speculative scenarios do not demonstrate that such chains of creators actually exist but illustrate how certain cosmological and multiverse models can accommodate them without evident contradiction. Thus, science and philosophy may be combined to explore the question of God further. Science does not preclude the possibility that humanity or an alien species could become god-like one day. Technological singularity, the Barrow scale, and various theories concerning the potential existence of the Omega Point pave the way for the hypothesis that one day we may acquire extraordinarily extensive capacities for control and understanding. Yet, conceptually, these would still constitute powers and knowledge bounded by the operative physical laws and conditions of whatever cosmos such beings inhabit. They would therefore fall short of the absolute omnipotence and omniscience traditionally attributed to the divine, and should be described more cautiously as "quasi-divine" or "maximal within a given nomological framework." The same theories that hypothesize the existence of a God, as discussed in section 2, may also be applied to humanity, as we may one day create laboratory or simulated universes, place people's extracted brains in a vat, or generate primordial cells on other planets. In each case, the analogy with divinity is suggestive but not identity-conferring: such creators would be powerful finite agents, not unconditioned, metaphysically ultimate beings.

Currently, the limitations of this study are related to the lack of technological tools and our incomplete understanding of many aspects of the cosmos, which leave hypotheses about the existence of God and the possibility of human civilization developing divine faculties unresolved. However, in this article, unlike Aczel (2014), who denies the possibility of discovering God's existence and, indirectly, whether humans can become like God, I highlight that there are tools and methods that could, in principle, allow human civilization to address these fundamental questions more effectively. Such methods include not only empirical investigation and theoretical modeling but also refined conceptual analysis that clarifies how terms like "probability," "creation," "omnipotence," and "omniscience" are being used. The study of mathematics, technological advancements, and contact with extraterrestrial civilizations could prove crucial in evaluating theories about God's existence or non-existence. Moreover, future research could explore how interdisciplinary approaches—combining progress in physics, cosmology, technology, and philosophy—may offer new insights into questions related to God and to the possible future status of intelligent life. Therefore, a temporary pragmatic agnosticism should be adopted regarding the deity hypothesis, as scientific and conceptual progress may one day enable a more informed assessment, and perhaps even

strong confirmation or refutation, of some specific theories involving God or denying His existence. In conclusion, this study outlines a framework for a future in which the great mysteries regarding the existence of God and the possibility that human civilization may develop god-like faculties could be investigated through the use of artificial intelligence, contact with extraterrestrial civilizations, and a thorough exploration of mathematical and cosmic information. It also encourages researchers to pursue the unknown with boldness and creativity, while remaining cautious about inferring inevitability or logical compulsion from future discoveries. As Einstein (1938, p. 83) stated: "To pose new questions, new possibilities, and to view old problems from a new angle requires creative imagination and marks real progress in science."

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