

Providence and the Magnitude of the Universe *

A theistic argument for space settlements

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Abstract

Why did God create a *vast* universe? Various answers are discussed and rejected: a) for its beauty; b) to instill a sense of the sublime in his intelligent creatures; c) to demonstrate his glory, d) to provide a home for extraterrestrial species; e) to guarantee that the natural emergence of (intelligent) life, though extremely rare, happens nonetheless somewhere; f) for no reason at all, because the human notion of efficiency does not apply to God's actions. Instead, the paper suggests that the universe is intended for Space settlements. Several objections to this proposal are considered and deemed unconvincing.

* This is the final authorized version of a paper, published in the Journal *Dialog 61* (2022). Nonetheless, the text differs significantly from the published article. Let me explain: AFTER I had sent a corrected version of the "final" proofs, the general editors eliminated dozens of male pronouns referring to God and inserted „God“ or „God's“ instead. Then they published the redacted version online, without prior consultation of the author. The stylistic results of the tacit redactions were at least in some cases abominable. Consider: „What if God wanted to erase God's own traces?“ instead of my original „What if God wanted to erase his traces?“ There are many similar, only slightly less drastic examples in the journal text. One could even argue that by these editorial changes the *meaning* of the text was altered. A reader may reasonably, but erroneously conclude that by using such tortured phrases I wanted to communicate a message beyond the literal meaning. (Think of Paul Grice's theory of conversational implicatures.) When I expressed my irritation, one of the editors told me “that yes, there is grammatical clunkiness when ‘He’ is replaced by ‘God’, but that clunkiness is much preferred to a continued perpetuation of a patriarchal reinforcing of a male God, which both explicitly and implicitly continues to privilege a patriarchal church”. The editor also apologized that “this came as a surprise” to me. Indeed. Don't get me wrong. I do not think that referring to God with male pronouns is innocuous. I do believe that renouncing all pronouns – even female or neutral ones – for God is an overreaction. Rational people may disagree on this, of course. What should be uncontroversial, however, is that it is editorial malpractice to significantly change the final proofs of a paper without prior consultation or even notification of the author.

1. Why is our universe so huge? A secular humanist will typically accept the vastness of the universe as a *brute fact*, or as a causal consequence of brute facts (initial conditions, laws of nature, natural constants etc.). Such an answer is not available to a traditional theist who holds that God exercises providence over the world. A theist may allow for *some* ontological chance in God's plans. Like a chess grandmaster who is (almost) guaranteed to win against an amateur, although she is unable to anticipate the exact move order of the game, the divine creator might have secured that all ends well, without predetermining or even foreseeing the exact course of events.¹ The magnitude of the universe, however, hardly ranges among the things that God would leave to chance. It isn't an insignificant detail of his creation. Or so it seems.

2. Might God have created the huge universe for its beauty?² This suggestion conflicts with the dull repetitiveness of cosmic structures. What aesthetic value is produced by adding yet another supercluster of galaxies to the millions that already exist? Besides this, for most of its future our universe will consist of an almost pure vacuum, where you would have to wait aeons to encounter a dispersed subatomic particle. I fail to see any beauty in this.

3. A somewhat more plausible hypothesis claims that God opted for a huge universe to instill a sense of the sublime in its inhabitants. Think of Immanuel Kant's famous remark on "the starry heavens" filling his mind "with ever new and increasing admiration and awe".³ However, Kant's kind of reaction is far from being universal. Nor is it clear that it is the proper reaction. When reflecting on the vast and mostly dead universe, Blaise Pascal, e.g., didn't feel sublime or humbled, he felt the horror of "a man transported in his sleep to some terrifying desert island, who wakes up quite lost, with no means of escape."⁴ Even worse, nowadays most people greet reports on an accelerated expansion of the universe or speculations about a multiverse with utter indifference. If God really wanted to instill a general sense of the sublime or of humility in humans, he failed.

It is also important to note that Kant hardly had a glimpse of *how* big our universe really is. For people living before the 20th century a much smaller universe would have been indistinguishable from the actual one and therefore would have had the same psychological effects on them. Moreover, if we learned tomorrow that the observable universe contains,

say, 100 million galaxies, rather than the actual 100 billion ones, this would presumably have no discernible cultural impact outside physics departments.⁵

4. Let us consider another popular proposal: God cherishes (intelligent) life and thus arranged for a habitat to accommodate countless other – extraterrestrial – species, some of them intelligent like us. There are at least two general problems with this suggestion.⁶ First, the only planet for which we know that it harbors life is Earth. There is little reason to think that life, let alone complex multicellular life, can emerge and evolve under conditions that are *radically* different from conditions on Earth. Despite recent progress in the detection of exoplanets, we lack a reliable estimate of the frequency of Earth-like planets in the observable universe. Nonetheless, we may safely assume the following: if the universe teems with life, the emergence of life on planets that share suitable astronomical, chemical and geological characteristics with Earth must be *fairly* probable.⁷ However, if the emergence of life on Earth, given its general characteristics, was fairly probable, we should expect to have by now a widely agreed-on, scientific account on life's emergence on Earth. But such an account is lacking. The origin of life is one of the biggest unsolved problems of science.⁸

Second, if intelligent life is allegedly widespread in the universe, why have not detected any signs of it? *Where are they?* This is the notorious Fermi paradox. Many, sometimes bizarre theories have been put forward to solve it, but the best and most simple explanation of the absence of evidence for alien life clearly is the extreme rareness of life in the cosmos.⁹

5. Both the Fermi paradox (reinforced by the discovery of an abundance of planets in our cosmic neighborhood) and the unsolved problem of terrestrial life's origin suggest that the emergence of life on Earth was a fluke. This may open a new avenue to solve our initial problem: Suppose God wanted to create a world in which life emerges naturally, rather than supernaturally by divine intervention. However, he knew that even under perfect conditions on Earth-like planets there would only be a minuscule chance for the formation of proteins and DNA needed to start the evolution of life. Eager to nonetheless virtually guarantee the emergence of life (and the evolution of intelligent life), the creator decided to bring about a huge cosmos with myriads of Earth-like planets, i.e. with an enormous number of occasions for the beginning of life. Even if on every Earth-like planet the chances for life were tiny, the natural emergence of life *somewhere* was (almost) certain.

Though a fascinating idea, this proposal faces serious objections, too. According to classical theism, God is omniscient. He infallibly knows every true proposition, including true propositions about the contingent future (if there is such a thing). Whatever the exact meaning of terms like “chance” or “probability” is supposed to be, according to classical theism, probabilities are irrelevant for God’s providential planning. Even if the fundamental laws of our universe were indeterministic and even if the objective probability of life’s emergence were tiny for every given planet, at the moment of creation, God knew exactly where life would originate. If so, he surely could have opted for a much smaller universe that preserves all the valuable features of our universe, while infallibly knowing that it would produce living beings, regardless of its more moderate size. This means that we still lack an answer as to why God chose to create a universe as huge as ours.

6. But let us assume, for the sake of argument, that classical theism is false and so called “open theism” is true. Open theism, which in recent years has gained much in popularity, claims that even for God it is metaphysically impossible to infallibly foreknow the contingent future.¹⁰ Now suppose that God wanted to bring about corporeal *free* beings. He therefore chose an indeterministic physics that leaves wiggle room for his creatures,¹¹ i.e. deterministic interpretations of quantum physics are incorrect, the future isn’t fixed etc. Suppose also that God is unwilling to miraculously interfere with the course of nature after creating *ex nihilo* (perhaps apart from the time during which he incarnates). If so – and given that on each planet there is only a tiny chance for the natural origin of life –, to make sure that life will emerge and intelligent beings will evolve, God had to create a huge universe, with innumerable occasions for the emergence and evolution of life!

The most important objection to this modified proposal goes like this: If God’s providential plan was to create free beings in an indeterministic universe, the way he executed this plan appears to be highly inefficient. However, God is a cognitively perfect being who would not act inefficiently, i.e. irrationally. Therefore, the modified proposal can’t be correct.¹²

To illustrate: Imagine that God, who wants to create corporeal animate beings, had to choose between two possible worlds with different indeterministic laws of nature and/or initial conditions and natural constants. World₁ would teem with living beings on almost every planet.¹³ In world₂, however, for every inhabited planet there are, say, 10¹⁰⁰⁰⁰⁰ sterile planets.

Assume that the lifeless planets are without any intrinsic value. Would not God have an overriding reason to create world₁ rather than world₂?

Even worse, note that as long as the number of Earth-like planets in a universe is, though huge, *finite*, there remains a tiny, but not infinitesimally tiny, chance that God's plan of bringing about free beings would be thwarted. From the perspective of a perfect creator, such a risk seems unacceptable. So, either, just in case that no life emerges naturally, God needs to have a plan B; e.g. the performance of a miracle. Or God has to create an *infinite* number of planets on which there is a finite chance for the emergence of life. However, without a reparative divine intervention, this would presumably result in an infinite number of species, even if God's original providential plan only envisaged a finite one. In both cases the clumsiness of God's creative efforts would be glaringly obvious.

7. There is an interesting counter-objection to this criticism: "Efficiency is a good property to have if one has limited power or limited time, or both. But apart from such limitations, it is not clear at all that efficiency is the sort of property it is better to have than to lack."¹⁴

However, denying efficiency the status of a divine virtue may lead to counterintuitive consequences. Imagine the following situation:

There are three vessels of capacities 3, 5, and 8 liters respectively, the first two empty and the third full. The liquid has to be divided into two equal parts. Imagine three mathematically untrained, average talented persons with the same relevant background knowledge. Person A fetches a 4-liter vessel from a neighbor house and accomplishes the task within five minutes. Person B senses that no additional vessel is needed. She applies the method of brute force, i.e. constant trial and error and succeeds in five minutes. Person C goes into deep thinking; it takes her 15 minutes to figure out the solution. Who behaved more efficiently? A and B needed less cognitive effort, less time and ran less risk of failing or making a mistake than their counterpart. However, C needed fewer vessels than A and fewer trials than B: Clearly, C's solution is the most elegant and most sophisticated one. Imagine that a perfectly wise creator finds herself in the same situation. Wouldn't it be most fitting for her to choose C's solution and reject the crude ones?

There seem to be two kinds of efficiency. There is efficiency with respect to physical resources like time, effort, money etc. Call this 'practical efficiency'. In addition, there is efficiency with respect to combinatorial (logical, mathematical...) resources. Call this 'theoretical efficiency'.

Practical efficiency is relative to the agent's talent and training, while theoretical efficiency is not.

Why are we supposed to be efficient? *Ceteris paribus*, we should aim at practical efficiency because it is bad for us to waste our limited physical resources. We should, *ceteris paribus*, aim at theoretical efficiency because theoretical efficiency is an (aesthetic?) good *sui generis*. While it is bad for human beings to waste resources, it isn't bad for a being who has unlimited capacities. Therefore, *practical* efficiency is not a divine attribute. However, if theoretical efficiency is an intrinsic good, then it is, *ceteris paribus*, a good property to have, for finite and infinite beings alike. Nor is there any obvious reason why theoretical efficiency might be in conflict with other divine attributes. Therefore, if God has no infallible foreknowledge, and wants to create corporeal animate beings, he will (a), all things being equal, prefer the creation of a universe whose initial conditions guarantee the emergence of life to the creation of a universe that might require future adjustments on his part and (b), *ceteris paribus*, prefer the creation of a universe in which the emergence of life is not brought about by a trillion- or even infinite-fold trial and error-method, but in more straightforward and simpler ways.¹⁵

So, if life is sparsely distributed over our huge cosmos, the reason for this cannot be that the divine creator doesn't care about efficiency.¹⁶

8. We have checked a couple of explanations as to why God might have created a universe as big as ours and have found them wanting. There is only one explanation left that I could think of: Our cosmos is intended for exploration and settlement. Although often dismissed as mere science fiction or idle speculation, not only interstellar, but also intergalactic travel seems feasible. Stuart Armstrong and Anders Sandberg from the *Future of Humanity Institute* in Oxford maintain: "travelling between galaxies – indeed even launching a colonization project for the entire reachable universe – is a relatively simple task for a star-spanning civilization, requiring modest amounts of energy and resources."¹⁷ To be sure, the past optimism that descendants of the human species might be able to control the whole universe was ill-founded.¹⁸ There are regions of the universe that cannot be reached by us, in principle. Although my argument hinges on the fact that life in the universe is sparsely distributed, it does not presuppose that we are alone. Regions that are out of reach might be intended for settlements by intelligent species who do not originate from Earth.

Since populating space is part of God's providential plan, we can reasonably expect that the settlement process will not just add more of the same to the pool of human experiences, but rather will enrich it with genuinely new knowledge, skills, practices, emotions and values. Inevitably, a bunch of new species will evolve from *homo sapiens*, some of them with enhanced cognitive, physical, moral and spiritual capabilities. Past prophecies of an "end of history", an "end of arts", an "end of science" will be laughed at as particularly bizarre details of antiquity.

If I am right, the vast and empty universe should be interpreted by theists as a divine invitation, as God giving his blessing to intergalactic space-faring and settlement. This doesn't mean, of course, that the human departure to the stars will be without setbacks, hardships, failures, tragedies. The technological, social, psychological, moral and religious challenges will be enormous. Humanity may even screw up the whole thing. Tomorrow nuclear powers may bomb the Earth into oblivion. Such is the human condition.

Still, theists have reasons to believe that the enterprise of intergalactic settlements is worthwhile that atheists lack.

9. Let us briefly consider some important objections.

a) "From the fact that you cannot think of any further reason as to why God created a huge universe, it does not follow that there is no such reason." True enough. However, I have put forward an explanation that strikes me as plausible. To retort that there might be a better explanation, *unbeknownst to anyone*, is unconvincing.

Moreover, if systematically applied, this kind of objection would not only undermine natural theology, but human knowledge, in general. We may think that the universe is older than 100 years and that God has no good reason to deceive us in this respect. However, from this it does not follow, that he has no such reason etc.¹⁹

b) "What if God wanted to erase his traces? If he wanted to produce a situation of epistemic ambiguity, to make room for faith and freedom of choice? The most rational, the most efficient thing to do for a designer, *solely* interested in bringing about human (or human-like) beings, would have been the creation of just one solar system with a naturally inbuilt guarantee for the emergence of life. God refrained from doing that, because this would have made his existence far too obvious to intelligent creatures. Instead he opted for a huge and completely arbitrary magnitude of the universe to muddy the waters." The suggestion that

God is playing some kind of four-dimensional chess with us is fascinating and has indeed some merit in other contexts. However, I do not accept the premise that in a small world the existence of God would be much more obvious than in our world. It is a marvelous thing in need of explanation that our universe permits life at all. What makes the situation with respect to God's existence nonetheless epistemically ambiguous is *not* the fact that our universe is big or life in it rare, but the problem of evil and the problem of divine hiddenness. These problems could be just as virulent in a small universe as they are in ours.

c) "If it was God's providential aim that we settle all over the universe, why hasn't he made us start yet? Almost nobody – with the exception of some transhumanist nerds – seems to be interested in this stuff." First, to give just one example, there *was* remarkable interest in a one-way mission to Mars, including a socially diverse number of volunteers.²⁰ Second, nothing in my argument entails or even suggests the existence of a mass movement right now. Life on Earth will sooner or later become *very* uncomfortable. It is a safe bet that on the verge of Earth's inhabitability at the latest many people will develop a strong interest in figuring out how the human species may survive beyond its home planet. And then, eventually, humanity will take steps to escape.

d) "If we really are on the threshold of a triumphant era of space-colonizing, is it not surprising that we find ourselves in a generation at the very beginning of that era? If the human race will prosper all over the galaxy or even the whole universe, our position would be extraordinary early in man's history. Therefore, it seems much more plausible (and much more in line with human nature!) that before the start of an interstellar settlement program we will have caused the extinction of our own species." This is an intriguing objection based on the so called "doomsday argument", put forward by astrophysicist Brandon Carter and philosopher John Leslie.²¹ It has sparked an intense, often highly technical discussion that cannot be resumed here. Suffice to say that most authors have found the argument unconvincing.²²

e) "There is a good chance that the universe is not only huge, but infinite. In this case, the human species were presumably only one of an infinite number of intelligent species and could only colonize an infinitesimally small region of the universe. If so, human space-faring efforts will make no discernible difference in the grand scheme of things or to the overall value of the universe and thus are completely pointless." The objection clearly proves too much. If human space colonization were pointless in an infinite universe, *every* other human enterprise would be pointless, too. This cannot be true.²³

f) “Your argument hinges on a significant number of contested premises. Even conceded that you have shown for any single assumption that it is plausible, the *conjunction* of the assumptions is not. Consider ten propositions, each with a probability of 90%. The probability that *all* of them are true is less than 35%.” I must confess that this objection gives me some pause. It might be true that I haven’t established as more probable than not that God, if he exists, intended the huge cosmos for settlements. However, I do believe that I have established that the space settlement hypothesis is superior to any of its rivals. Theists have good reasons to boldly go, where no one has gone before.

¹ The grandmaster analogy was invented by Peter Geach: *Providence and Evil*, Cambridge 1977, 58.

² Cf. “God has every reason for bringing about the process of development from the Big Bang for its beauty – even if he were the only person to observe it” (Richard Swinburne: *The Existence of God*, Oxford, 2nd edition 2004, 188).

³ Immanuel Kant: *Critique of Practical Reason* [1788], trans. Lewis White Beck [Chicago 1949], Akademie-Ausgabe vol. 5, 161.

⁴ Blaise Pascal: *Pensées* [posth. 1670], fragment 693/198; numbering: Brunschvicg/Lafuma; trans. A. J. Krailsheimer, Harmondsworth 1966.

⁵ Nor would it be a lesser demonstration of the creator’s glory. Rather the contrary. As one of Stanisław Lem’s characters remarks: “The monotony of creation would seem to be the most crass and uninspired idea one could possibly imagine. A dotted nothingness going on and on into infinity – who would contrive such a witless thing if it had yet to be created? Only a cretin, surely. [...] Indeed it is only the result of self-plagiarism” (King Globares and the Sages, in: *Mortal Engines*, trans. Michael Sandel, New York 1977, 110).

⁶ There is also a special problem for traditional *Christian* theology: Given that the universe contains myriads of other (sinful) civilizations, is there a sensible way in which the Christian believer can continue to claim that Jesus Christ “through the blood of his cross” has reconciled “*all* things [...] whether they be things in earth, or things in heaven” (Colossians 1, 20)? Soteriological geocentrism does not seem any more plausible than the Ptolemaic variant. See my Christian Soteriology and Extraterrestrial Intelligence, *Journal of the British Interplanetary Society* 67 (2014), 418-425.

⁷ Note that, for the moment, I ignore the panspermia hypothesis and colonization via interstellar spaceflight.

⁸ Of course, there are obstacles to the development of a successful theory of life’s origin on Earth that exist independently from the (low) likelihood of the emergence of life on Earth-like planets. E.g., there are few financial incentives for a scientist to do origin of life research; scientists face enormous difficulties in reconstructing a biochemical environment that existed four billion years ago etc. However, I do insist that origin of life researchers and astrobiologists have no good reason to cavalierly dismiss the possibility that there simply is no informative theory or elaborate mechanism of life’s origin to be found. Instead the emergence of life might be due to a series of highly improbable chance events that happened only once or twice in the history of the entire observable universe. If that were the case, it would also nicely explain the disagreement among origin of life researchers!

For an extensive defense of the chance hypothesis see my: Is the Origin of Life a Fluke? Why the Chance Hypothesis Should Not be Dismissed Too Quickly, in: *What is Life? On Earth and Beyond*, ed. Andreas Losch, Cambridge 2017, 132-155. See also Roger White: Does origins of life research rest on a mistake?, *Nous* 41 (2007), 453-477.

⁹ Cf. Michael H. Hart: Explanation for the Absence of Extraterrestrials on Earth, *Quarterly Journal of the Royal Astronomical Society* 16 (1975), 128–135; see also Stephen Webb: *If the Universe Is Teeming with Aliens ... Where is everybody?: Fifty Solutions to the Fermi Paradox and the Problem of Extraterrestrial Life*, New York 2002.

¹⁰ The amount of literature on the problem of divine foreknowledge is enormous; for a recently updated overview see Linda Zagzebski; David Hunt: Foreknowledge and Free Will, *The Stanford Encyclopedia of Philosophy* (2021), <<https://plato.stanford.edu/archives/win2021/entries/free-will-foreknowledge/>>.

For a theological exposition of open theism and its merits see Thomas Jay Oord: *The Uncontrolling Love of God: An Open and Relational Account of Providence*, Downers Grove 2015.

¹¹ Like most classical theists, open theists assume that compatibilism is false: free will and physical determinism are incompatible.

¹² For a related argument with respect to Big Bang cosmology that illustrates the spirit of this objection, see Quentin Smith: Atheism, Theism and Big Bang Cosmology, *Australasian Journal of Philosophy* 69 (1991), 48-66; see esp. § 5.

¹³ So called "modal skeptics" may object that there is no way of knowing whether a physics that will result in such a world is (logically or metaphysically) possible, see e.g. Peter van Inwagen, The Problem of Evil, the Problem of Air, and the Problem of Silence, *Philosophical Perspectives* 5, 135-165, and Modal Epistemology, *Philosophical Studies* 92 (1998), 67-84. I reject this position in *Die Unverzichtbarkeit natürlicher Theologie*, Freiburg 2007, 277-297. See also the scathing comments by Richard Gale in: Some Difficulties in Theistic Treatments of Evil, *The Evidential Argument from Evil*, ed. Daniel Howard-Snyder, Bloomington 1996, 206-218; 213.

¹⁴ Thomas V. Morris: *The Logic of God Incarnate*, Ithaca 1986, 78.

¹⁵ Please note the all-things-being-equal (ceteris paribus-clause). I am *not* saying that God would never use subsequent interventions or trial-and-error as a means of achieving his providential goals. If he exists, he clearly did. *What* I am saying is, that he uses these things only if no *functionally equivalent*, more elegant solution is available. The use of copious trial-and-error etc., *cannot* be explained by claiming that God is not committed to efficiency.

¹⁶ Parts of this paragraph have been taken from my article „Indeterminism“, written for the Special Divine Action (SDA) Online-Project, Oxford (2014-16). I've augmented the example and adapted the conclusions to the somewhat different context here. Unfortunately, all articles of the SDA-project seem to be offline at the moment.

¹⁷ Stuart Armstrong; Anders Sandberg: Eternity in six hours: Intergalactic spreading of intelligent life and sharpening the Fermi paradox, *Acta Astronautica* 89 (2013), 1-13; 1.

¹⁸ See e.g. Frank J. Tipler: *The Physics of Immortality*, New York 1994, ch. 2.

¹⁹ See Bruce Russell, Defenseless, *The Evidential Argument from Evil*, ed. Daniel Howard-Snyder, Bloomington 1996, 193-205; 196.

²⁰ Cf. Paul Davies; Dirk Schulze-Makuch: *A One Way Mission to Mars. Colonizing the Red Planet*, Cambridge (Mass.) 2011, 333-362.

²¹ John Leslie, *The End of the World*, London 1996, chs. 5&6.

²² Just one example among many: Ben O'Neill: Assessing the "Bayesian Shift" in the Doomsday Argument, *Journal of Philosophy* 111 (2014), 198-218.

²³ For an instructive discussion of related problems, see Nick Bostrom: Infinite Ethics, *Analysis and Metaphysics* 10 (2011), 9-59.