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GOD, FINE-TUNING AND THE MULTIVERSE: AN ARGUMENT FROM PANTHEISM

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ABSTRACT: This paper examines the multiverse hypothesis as a proposed challenge to the fine-tuning argument for the existence of God. Using Bayesian confirmation theory, it argues that the multiverse does not significantly undermine fine-tuning. However, when the fine-tuning argument is assessed within the same Bayesian framework, traditional Abrahamic theism fares no better. The paper then proposes that pantheism, interpreted through integrated information theory, offers a more promising explanation of why the universe is finely tuned for life. Indeed, panpsychism follows from pantheism, and an evolving universal consciousness with intrinsic causal power is, for the pantheist, a consequence. Such causal power maintains the fundamental constants of the universe to enable continuity of this consciousness. This self-preservation objective has causal implications for the existence of life, as these fundamental constants are also conducive for life in the universe. Moreover, the very existence of these fundamental constants increases the likelihood of a pantheistic god. Though not a creation teleology, this pantheistic perspective provides an explanation for the existence and continuity of life in the universe.

KEYWORDS: Multiverse; bayesianism; integrated information theory; implicate order; pantheism

Introduction

Richard Swinburne sums-up the theistic perspective of the fine-tuning argument: "…while it is significantly probable that there would be a universe fine-tuned for the occurrence of human bodies or "particle bodies" if there is a God, it is not at all

probable that there would be such a universe if there is not a God." (Swinburne, 2003, p. 120).[1]

The primary atheistic repost to this fine-tuning argument is the multiverse hypothesis, and most, if not all, fine-tuning arguments engage with it to a greater or lesser extent (Manson, 2003, pp. 17–21). I too address the multiverse argument and contend, like most, that because our universe is well-tuned for life, it does not make the existence of a multiverse more likely for that reason. I argue that the existence of any universe, with any set of fundamental constants, makes the existence of a multiverse more likely, but still not very likely. This, I suggest, leaves opportunity for a theistic explanation of fine-tuning for life, but that the omni-God theology of the Abrahamic religions does not provide the probabilistic wherewithal for such an explanation. However, I believe that the existence of a pantheistic God does.

Giulio Tononi's (2004) *integrated information theory* of consciousness together with David Bohm's (1980) concept of the *implicate order*, has a parallel with the universe itself. That is, there is a materialistic integration of information throughout the universe to such a degree that consciousness unfolds from it. Like animal consciousness, this pantheistic universal consciousness possesses intrinsic causal power, a power over itself, or more specifically, a power over the universe. Given this wherewithal, such power would ensure that the fundamental constants of the universe are maintained to ensure its own existence. These fundamental constants are also conducive to life; consequently, within such a fabric of reality, life can evolve, including conscious life that, in its advanced form, is able to engage with this pantheistic deity.

Pantheism has been a religious tradition for some time. However, my intention is to strengthen its probabilistic relationship to the fine-tuning argument for the existence of life though the application of integrated information theory.

The Multiverse Argument

A common atheistic retort to the theistic explanation for our universe possessing the fundamental constants conducive for life is the multiverse argument. In short, the argument asserts that if there exists a vast number of universes all with variable fundamental constants acquired by chance, then at least one of them will possess those finely-tuned for life (Tegmark, 2014, Chs. 10–13). In answer to the lack of any material evidence for a multiverse, it is claimed that its existence is probabilistically confirmed by the fact that our universe is finely tuned for life.[2]

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[1] By "particle bodies" Richard Swinburne means humans with spatial location but not extension (Swinburne, 2003, p. 111).

[2] The number of fundamental constants of our universe is imprecise because of variation in detail and the physics in question. There are, however, a considerable number (Barrow & Tipler, 1996, pp. 238–243).

The laws of nature or nomological laws are sometimes cited as an essential and stable state of affairs of the universe, see Richard Swinburne, 2004, pp. 26–35. However, there is doubt as to the stability of such laws (Barrow & Tipler, 1996, pp. 255–258).

The Inverse Gamblers' Fallacy

This claim is challenged through the *inverse gambler's fallacy,* a fallacy based upon the chance acquisition of the fundamental constants. The chance of a universe acquiring a particular set of fundamental constants, whether life-conducive or not, does not depend upon a prior set of instantiated fundamental constants. The chance is intrinsic to the event, rather like a thrown die showing 6 does not depend upon previous throws (Hacking, 1987).

What is not fallacious however, is that if there are a vast number of universes, all with variable fundamental constants acquired by chance, then at least one of them is likely to possess the finely-tuned constants conducive to life. It is the reverse of this that is fallacious; i.e. finely-tuned to multiverse rather than multiverse to finely-tuned.[3]

The Selection Effect

This anthropic argument for the existence of a multiverse on the basis of fine-tuning, aims to avoid the problem of the inverse gambler's fallacy. It asserts that as we exist, a universe with the finely-tuned fundamental constants conducive to life must exist. The argument also acknowledges that the existence of a multiverse increases the probability that a constituent universe will possess the finely-tuned fundamental constants conducive to life. Consequently, the existence of us, and hence the existence of a finely-tuned universe, probabilistically confirms the existence of a multiverse (McGrath, 1988, pp. 265–268).

The argument avoids the inverse gambler's fallacy by the anthropic addition; i.e. it is our existence that makes the existence of a finely-tuned universe certain, not because there exists a multiverse. But if one does exist, this increases the likelihood of a finely-tuned universe. It then follows, that our existence increases the likelihood of a multiverse. However, the argument falters, as although our existence confirms with certainty that *our* universe is finely-tuned for life, it could have been a different universe that is finely-tuned for life with other beings alive in it. It is still by chance that *our* universe exists and the inverse gambler's fallacy holds (White, 2003, pp. 235–238).

Essentialism

Another response to the fallacy is to assume that the fundamental constants of a universe are ridged designators of that universe. Thus, a universe with the same fundamental constants of our universe *is* our universe; there cannot be a copy. Assuming the multiverse hypothesis increases the probability of the existence of life-conducive fundamental constants and *is* our universe, then the existence of our universe increases the probability of the multiverse hypothesis. Therefore, given this

[3] Richard Swinburne is quite critical about assuming a multiverse hypothesis simply to explain the facts of fine-tuning (Swinburne, 2003, p. 117).

essentialist's conception, the inverse gambler's fallacy is apparently defeated (Holder, 2002, pp. 304–306). However, the fundamental constants that govern our universe cannot be viewed as designators, rather it is what is materially observable that designates it.[4]

The Replication Principle

The above arguments naturally raise the question of whether there is any evidence for a multiverse. Unfortunately, there is limited evidence other than the existence of one universe; that is, our universe, which happens to be life-conducive.[5]

If our universe resulted from a big-bang event, there is no reason to suppose that other big-bang events did not occur resulting in other universes; i.e. *a replication principle*. Thus, it is reasonable to assume that the probabilistic likelihood of one big-bang universe is the same as the probabilistic likelihood of many big-bang universes.[6] Nevertheless, it is also reasonable to assume that there is a higher probability of nothing existing than of something existing.[7]

Even Chances

Following the putative Bayesian approach to this problem, let:

1. U mean *there is a specific universe,* and
2. M mean *there is a multiverse* with ¬M mean *there is not a multiverse*,[8] and
3. k mean *background knowledge* (additional relevant information including assumptions).[9]

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[4] Philip Goff makes this and other criticisms of the essentialist's argument (Goff, 2024, pp. 9–10).

[5] Interestingly, Ranga Chary investigated "bruising" of the microwave background of the universe indicating possible universe collisions (Chary, 2015).

[6] Swinburne argues that one universe is more simple than many, and given the Principle of Simplicity, one universe is more likely than many universes (Swinburne, 2004, p. 285). However, the Principle, per se is very questionable, (Howson & Urbach, 1991, pp. 290–292) and in this instance, Swinburne confuses type with token; the Principle is type-focused, and one universe is the same type as many of the same (Manson, 2003, p. 19).

[7] Richard Swinburne employs this principle in his probabilistic analysis for the existence of God: "…it seems *a priori* vastly improbable, if one thinks about it, that there should exist anything at all logically contingent." (Swinburne, 2004, p. 109).

[8] I define the multiverse hypothesis M as *more than one universe exists*, and its negation ¬M to be *not more than one universe exists* whereas the proposition *there is no multiverse* could include no universes whatsoever.

[9] "…*k* is our general background knowledge, of what there is in the world and how it works,…" (Swinburne, 2004, p. 66). This also includes auxiliary assumptions that create a probabilistic relationship between evidence and hypothesis. Such assumptions must themselves be justified (Sober, 2008, p. 168).

Then, from the above replication principle, the likelihood function $Pr(U|\neg M \,\&\, k)$ is the same as the prior $Pr(M|k)$; that is, many universes are just as likely as one. However, if there is a multiverse, then there is a greater probability of a specific universe existing than only one existing universe being, by chance, that specific one; consequently, $Pr(U|M \,\&\, k) > Pr(U|\neg M \,\&\, k)$. Moreover, given the principle that nothing is more likely than something, $Pr(U|\neg M \,\&\, k)$ is low (likewise $Pr(M|k)$), and consequently the likelihood ratio $Pr(U|M \,\&\, k)/Pr(U|\neg M \,\&\, k)$ is high.

From the above assumptions, the likelihood ratio form of Bayes' theorem shows $Pr(M|U \,\&\, k) > Pr(M)$; i.e. confirmation. This can be shown as follows:

Bayes' theorem (likelihood ratio form): [10]

$$Pr(M|U \,\&\, k) = \frac{\lambda \times Pr(M|k)}{[\lambda \times Pr(M|k)] + [1 - Pr(M|k)]}$$

where:

$$\lambda = \frac{Pr(U|M \,\&\, k)}{Pr(U|\neg M \,\&\, k)} > 1$$

then it can be seen that $Pr(M|U \,\&\, k) > Pr(M)$; that is, confirmation. Moreover, given the above assumption $Pr(U|\neg M \,\&\, k) = Pr(M|k)$, then $Pr(M|U \,\&\, k)$ is circa 0.5 or just as likely as not or *even chances*.

Above, I have used the expression *our universe* as well as *a universe*. Relevant literature employ the equivalent expressions *this universe* and *some universe*. This difference (our/this vs a/some) is important to the argument, as the likelihood ratio λ changes when referring to *our* or *this* universe. Indeed, $\lambda = 1$ with such a scenario, as our universe or this universe exists whether or not there is a multiverse. For example, if a thrown die is showing 6 (this 6) it matters not whether it resulted from one or many throws of the die. On the other hand, the probability of throwing 6 (a 6) increases with the number of throws. This is the essence of the *inverse gambler's fallacy*.[11] Thus if $\lambda = 1$, there is no confirmation as $Pr(M|U \,\&\, k) = Pr(M)$.

Old Knowledge

It has been argued that k should include knowledge of our universe or this universe and therefore k would entail U (a or some universe), and consequently, $\lambda = 1$, and $Pr(M|U \,\&\, k) = Pr(M)$; that is, no confirmation.[12] Roger White argues that, with respect

[10] The positive likelihood ratio λ is a probabilistic measure that quantifies how much more likely the evidence is under a specific hypothesis (h) compared to its alternative hypothesis, which in this case, is its negation (¬h).

[11] Cory Juhl provides a detailed explanation of the this/some difference within the gambling context of a roulette wheel (Juhl, 2005, pp. 337–343).

[12] This is known as *the problem of old knowledge* first introduced by Clark Glymour (1980).

to the *total evidence requirement* such knowledge should be accounted for (White, 2003, pp. 233–234). However, engaging this background knowledge in the analysis only serves to obfuscate the probabilistic relationship between evidence and hypothesis. Therefore, such knowledge should be expeditiously treated as counterfactual and held in reserve pending Bayesian conditionalisation (Howson & Urbach, 1991, pp. 270–275).[13]

Given that the chances of a multiverse existing are evens, then there exists an explanatory gap for a possible theistic explanation for the existence of our universe being finely-tuned for life.

Divine Fine-tuning

A probabilistic analysis of the fine-tuning argument for the existence of God is fraught with problems. Consider for example the likelihood ratio:

$$\lambda = \frac{\Pr(U^{\text{Life}}|G \,\&\, k)}{\Pr(U^{\text{Life}}|\neg G \,\&\, k)}$$

Where G is the proposition God exists, and U^{Life} is our universe that possesses the finely-tuned fundamental constants conducive to life. In the three Abrahamic religions, God is omnipotent, omniscient and omni-benevolent. There are additional attributes, but these three omni-predicates are the assumed fundamental rigid designators of God. I employ the specific evidence of *our universe* as opposed to the assumed *a universe*. This is because the only evidence of fine-tuning for life is this universe, and in fact, as it stands, just the planet Earth, as this is, at present, only where we know life exists.[14] Elliott Sober, echoing Hume, makes the salutary point that such limited evidence makes an inductive fine-tuning argument based on sample size weak. However, a likelihood ratio is not, as the two hypotheses G and ¬G confer different probabilities on what we can observe (Sober, 2003, p. 36). However, a serious problem arises with ¬G in the ratio. The falsity of any one of the omni-predicates would fulfil the proposition God does not exist. For example, if an omni-being were omnipotent, omniscient but malevolent to varying degrees and therefore, possessing the wherewithal to create U^{Life} but indifferent to animal and human suffering. With such a scenario the likelihood ratio would be:

$$\lambda = \frac{\Pr(U^{\text{Life}}|G \,\&\, k)}{\Pr(U^{\text{Life}}|\neg G \,\&\, k)} = 1$$

[13] Peter Epstein reaches the same conclusion by arguing that reaching a general conclusion on the basis of limited prior evidence is somewhat bias (Epstein, 2017, p. 649).

[14] Richard Swinburne places a lens on the nature of that life to demonstrate a probabilistic relationship with God; e.g. persons with free will and moral potential (Swinburne, 2003, pp. 107–114).

As has been demonstrated above, if $\lambda = 1$ then there is no probabilistic confirmation of the theistic hypothesis (G) by the evidence of our finely tuned universe (U^{Life}). Consequently, the finely-tuned argument for the existence of God (as so defined) fails.

To address this malevolence argument, the fine-tuning apologist would have to demonstrate that possession of the attributes omnipotence and omniscience entail omni-benevolence. For example, if malevolence can be shown to be exclusively the result of weakness or ignorance. In fact, Richard Swinburne argues that given perfect freedom (which I believe is necessitated by omnipotence), omni-benevolence follows from omniscience. However, Swinburne employs *moral realism* in his analysis; that is, objective moral truths exist that are independent of our beliefs. He argues that an omnipotent, omniscient perfectly free being would necessarily engage with such truths; hence, omni-benevolence (Swinburne, 2004, pp. 99–106). Nevertheless, and as Swinburne acknowledges (Swinburne, 2004, pp. 99–100), even though such a view is plausible, it is also contentious. Indeed, Abrahamic scriptural evidence points to the Divine acknowledgement of rule-consequentialism as the preferred ethical principle (Hunt, 2022, pp. 53–70).

The omni-predicates as rigid designators are maximisations of certain approbative human qualities; i.e. powerful, knowledgeable and loving, and are intended, certainly within the Abrahamic religions, to define God. However, their anthropomorphic origin weakens their designatory precision by being analogous rather than factual, implying a lack of precise similarity. This raises doubt as to the actuality of these Divine attributes that collectively suggest the ability to create the universe.

Chance, God and the Likelihood Principle

"It is not necessary to invoke God to light the blue touch paper and set the universe going." (Hawking & Mlodinow, 2010, p. 180). Indeed, an alternative likelihood comparison could be: $Pr(U^{Life}|G \,\&\, k)$ v's $Pr(U^{Life}|C \,\&\, k)$ where C is a chance event. Their comparison could be evaluated through the *Likelihood Principle*. The Principle states that the likelihood function contains all of the information relevant to the evaluation of evidence. Thus, let:

1. U^{Life} be our universe that possesses the fundamental constants conducive to life, and
2. G^{Life} mean *God, the omni-being, exists and desires to create life*, and
3. C mean *there is a physical cause of a universe, and the values of any fundamental constants of it will be purely chance events*.

Visceral intuition suggests that $Pr(U^{Life}|G^{Life} \,\&\, k) > Pr(U^{Life}|C \,\&\, k)$, then from the Likelihood Principle, U^{Life} supports G^{Life} more than C (Søvik, 2020, p. 58). However, there is something incongruous about the instantiation of the universe being a chance event given that the concept of chance is a purely random event conditional on a set

of repeatable conditions; e.g. throwing a fair die.[15] However as far as we know, the big-bang was a one-off event with a very obscure cause, possibly quantum fluctuations in a vacuum (Tegmark, 2014, pp. 107–110).

Although quantum fluctuations in a vacuum have been experimentally verified, their application to causing the big-bang scenario is still very speculative.

Propensity, as a singular probability, would be a better concept than chance, and it would be compatible with subjective probability. Indeed, although the big-bang may be a one-off objective event, we can still take a subjective probability position (Howson & Urbach, 1989, p. 228). Even then, the auxiliary assumptions buttressing the conditional $Pr(U^{Life}|C \,\&\, k)$ would need to be warranted, and there is no comparable event to make such a judgement. It seems that the concepts of chance and propensity are inapplicable prior to the big-bang event; (Sober, 2003, pp. 45-49).

It could be argued that $Pr(U^{Life}|C \,\&\, k) > Pr(U^{Life}|G^{Life} \,\&\, k)$ on the grounds that repeated universe instantiations would have eventually led to U^{Life}, but this would return us to the *inverse gambler's fallacy* introduced above. Further, from the malevolent omni-being example above, the following intuitive likelihood comparison would equally apply: $Pr(U^{Life}|\neg G^{Life} \,\&\, k) > Pr(U^{Life}|C \,\&\, k)$, but this is hardly the result the theist would hope for. Moreover, the Likelihood Principal ignores the prior probabilities of the respective hypotheses; i.e. $Pr(C|k)$ and $Pr(G^{Life}|k)$, which a Bayesian analysis would include,[16] and in terms of subjective probability, with a wide variation in values between the atheist, agnostic and theist.

Perhaps designators other than the omni-predicates may be less contentious; for example, "the most fundamental entity and worthy of worship", or "the highest one", or by ostension, such as "…*that which is known in veridical religious experiences*" (Goff, 2023, p. 119). The problem with such designators is they have little probabilistic force on U^{Life} as well as being, like the omni-predicates, very anthropomorphic. Such numinous experiences, often associated with the beauty of the world, can lead to a pantheistic leaning, where God is all around us. Indeed, an alternative approach to the omni-God/fine-tuning argument is through the diverse theological viewpoints of pantheism.

Some pantheists take a partial identity perspective of God and the universe, where God is viewed as a proper part of the universe, but in addition manifests a divine nature. This perspective is known as *immanentism.* Alternatively, the universe is seen as a proper part of God. With this perspective, God is both immanent (within) and transcendent (beyond), This perspective is known as *panentheism*. These partial identity perspectives can overlap, but some pantheists go further and accept a strict identity between the universe and God.[17] Herein, I interpret pantheism in terms of

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[15] See David Mellor on the repeatable characteristic of chance and its consequential lack of applicability to the big-bang event (Mellor, 2003, pp. 225–227).

[16] The likelihood ratio form of Bayes theorem does not apply to this analysis as C and G^{Life} are probabilistically unrelated. Therefore, two Bayesian calculations would be needed and the priors would be vital elements of both.

[17] This is Benedict Spinoza's pantheistic perspective; namely, God is the same as the universe as there is only one substance, and that is God/nature. They are one and the same, with things of the world being parts of this one substance (Spinoza, 2001, 1st part, Prop. 14).

immanentism; i.e., a universal theophany of the *collective pantheism* form,[18] and base this assertion on the validity of three hypotheses:

1. The *panpsychism* hypothesis, and
2. the *integrated information theory* of Giulio Tononi, and
3. the *implicate order* concept of David Bohm.

Before considering pantheism and its respective teleology, I address these hypotheses as follows:

Panpsychism

Panpsychism is an early animistic philosophy of mind, but is now characterised by differing perspectives. For example, all matter has phenomenal consciousness or only biological matter does or only fundamental particles do or the mind of God suffuses reality.[19] Herein, I follow the fundamental particle position, or micro-psychism.[20]

The panpsychist hypothesis states that the physical characteristics of reality are not exhaustive, intrinsic mental properties are also a characteristic.[21] Both characteristics are fundamental and as such, cannot be reduced to non-physical properties or non-mental properties respectively. In fact, the hypothesis is, in part, a response to Cartesian dualism and the problem of mental causation (Kim, 1993, pp. 102–108, and physicalism and the problem of the epistemic asymmetry (Chalmers, 1996, pp. 101–103).

Panpsychism is a metaphysical concept that views the micro and macro-world as possessing a phenomenal property in addition to materialistic properties. A property manifesting itself in degrees of intensity. Thus, at the particle level, phenomenal conscious intensity is minimal, more with plants, high in the animal kingdom and, for the pantheist, the overall Divine consciousness is supreme (Fechner, 1946). This consciousness intensity continuum has been explained by a combination hypothesis where low conscious intensity, manifested in fundamental particles, combine or fuse to manifest high conscious intensity in, for example, the brains of animals. A maximal combination would perhaps explain Divine consciousness.

Problems arise with this combination hypothesis; collectively termed *the combination problem* with the *subject summing problem* being one example.[22] This problem relates to

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[18] Collective pantheism meaning that the divine immanence unfolds from the totality of the universe rather than being present in all parts of the universe (Oppy, 1997, p. 325n6)

[19] See Philip Clayton's discourse on this (Clayton, 2020, pp. 191–203).

[20] Current physics view fields as the fundamental reality, with quantum particles arising from fluctuations across these fields.

Galen Strawson, in his real-physicalism perspective of reality, also eschews the notion of an ethereal emergent consciousness from a purely physical substrate, favouring a similar pan-psychic explanation (Strawson, 2008, pp. 60–74).

[21] This duality is known as Russellian monism (Russell, 2023, pp. 353–363).

[22] William James considered the combination problem with his theory of *mind stuff* (James, 2010, Ch.6).

the distinct nature of different experiences seemingly making a combination contradictory. For example, sound, sight, pain and passion are such distinct experiences. Another is the *pallet problem*, so called because limited paint on an artist's pallet cannot combine to create a colourful painting. Likewise, limited consciousness cannot combine to create a sophisticated conscious experience. Yet another is the *structural mismatch problem*, so named as varying modalities of consciousness; e.g. colour, sound, feelings do not precisely correspond to the micro/macro brain structure (Goff et al., 2022, Sec.4).

Integrated Information Theory

One possible answer to the combination problem is through Giulio Tononi's (2004) Integrated Information Theory (IIT).[23] In short, he argues that consciousness is an undeniable first-person intrinsic reality and a result of maximal neural integration of information. The conscious state unfolds from this integrating neural substrate as a synergistic manifestation that possesses causal efficacy. In Tononi's ontology, causal efficacy is a property of all that exists, and the conscious state is real and does exist (Tononi et al., 2023, p.3).

> This intrinsic power, "from within", gains its efficacy from the reality of the *Φ*-structure ("truly existing"); its reality enabling such efficacy…This intrinsic power is expressed by taking and making a difference to the functioning of the neural substrate. Such intrinsic power enables agential choice and action based upon that choice. (Hunt, 2025, p. 13)[24]

Tononi's analysis is based upon five phenomenological axioms that abductively lead to five neurological postulates (Tononi et al., 2023, pp. 3–5). He argues that an unfolded phenomenological structure, the Φ-structure, is consciousness. Its realisation from its neural substrate is a brute fact, and this attracts scepticism of IIT; (Cerullo, 2015). However, there is also supportive evidence for its veracity; (Koch and Tononi, 2013).

Evidence for the veracity of IIT is clear given the level of neural integration during high and low conscious states, as well as brain damage states (Massimini et al., 2005). Moreover, high neural density in areas of the brain; e.g., the cerebellum (c. 70 billion neurons) is not the centre of conscious activity, whereas the area of high neural integration; e.g., the thalamocortical system is despite far less neurons (c. 16 billion neurons) (Tononi, 2004, p. 10).

IIT is a possible response to the combination problem of panpsychism. The move from low conscious intensity to high, under a possible panpsychic interpretation of IIT, is not a combination effect, but rather an effect of integration. This is best described

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[23] IIT has been progressively developed, see Albantakis et al., (2023) for a more recent analysis. Also, see Hedda Mørch's perspective on the combination problem and integrated information theory; (Mørch, 2019).

[24] The Φ-structure being the unfolded conscious state.

as synergistic harmonisation rather than fusion. Thus, the low-intensity conscious particles comprising the neural substrate possess panpsychic purpose; specifically, the transfer of information from neuron to neuron in a feedback process that, when maximal, results in the unfolding Φ-structure.[25] This maximal level has an absolute value range, and the greater the value the greater the level of consciousness. Further, there is variation in the quantity of integrated information available. Thus, a snail would be conscious, but less so than a cat. From an IIT perspective, low-level conscious particles also attain their conscious state from interparticle information integration, but it's extremely minimal.[26]

Philip Goff addresses the purposeful nature of micro-panpsychism. In particular his *meaning zombie argument* where he contrasts *functional understanding* (operational qualia) with *experiential understanding* (meaningful qualia). He argues that the acquisition and development of functional understanding can be explained by evolutionary forces, but not for experiential understanding. It is the conscious purposefulness of the particles involved that enables this ability (Goff, 2023, Ch.3). From an IIT perspective, it is the purposeful transfer of information by the conscious particles that enables both functional and experiential understanding.

The Implicate Order

David Bohm advanced the notion of the *implicate order* as an explanation of the nature of reality (Bohm & Hiley, 2003, Ch.15). This was a response to the pluralism of classical physics and quantum mechanics which he believed only encapsulated a superficial level of reality.[27]

His belief in the implicate order is primarily based upon the theories of physics adopted by the respected doyens of his time, together with his own research in quantum mechanics. In particular, the EPR paradox and quantum entanglement.[28] His landmark theory of quantum mechanics was his pilot-wave theory based upon De Brogie's earlier model; i.e. that the movement of particles are guided by a quantum wave potential. Both these conceptions influenced Bohm's metaphysics; specifically, that there exists a holistic and hidden fabric of reality.

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[25] A possible explanation of information transfer with IIT is Roger Penrose's microtubule hypothesis of quantum consciousness; i.e. quantum entanglement in the microtubules within the neurons and axons (Penrose, 1994, Sec.7.7). Indeed, recent neuro-research has demonstrated that loss of consciousness is related to loss of quantum entanglement in the microtubules (Sana Khan et al., 2024).

[26] See Christof Koch's perspective on the integration levels between low-Φ quantum particles and high-Φ animal consciousness and the notion of panpsychism (Koch, 2012, pp. 131–135).

[27] There is a whole reality at the sub-microscopic scale, for example 10^{-34}m, whereas present experiments cease at 10^{-15}m (the scale of particle collisions at CERN); thus, there is plenty of space for new experimental physics.

[28] EPR referring to the physicists Albert Einstein, Bosis Podolsky and Nathan Rosen. Bohm was also influenced by Einstein's general relativity and the holistic concept of spacetime. Recent experiments with entanglement lend support to Bohm's vision of interconnectedness (Malik et al., 2015).

The implicate order represent a radical interpretation of the universe, whereby it does not comprise separate, isolated parts; i.e. planets, stars and galaxies. Rather, the universe exists as a holistic and undivided whole where all reality is interconnected and interdependent through the implicate order. This contrasts with what Bohm terms as the *explicate order*; i.e. bacteria, snails, people, planets, stars, galaxies etc. This is the macro-ontological level of observation that unfolds from the hidden enfolded implicate order (Bohm & Hiley, 2003, pp. 361–362).

Bohm employs metaphors to elucidate his ideas; in particular, his hologram metaphor; (Bohm, 1980, pp. 182–190). He states that each part of a hologram contains the whole image. Likewise, the universe has a holographic-type nature at the fundamental level, such that each part of the universe holds information about its entirety; it is deeply interconnected. Such information can flow and move within the implicate order and Bohm refers to this as the *holomovement* (Blom, 1980, pp. 190–199). In fact, Bohm argues that consciousness and physical reality are not distinct, but unfold from the implicate order, leading to the notion that mind and the universe are interconnected (Blom, 1980, pp. 248–271).

Bohm's notion of the wholeness and interconnectedness of the implicate order, although unconventional, resonates with Tononi's integrated information theory and has panpsychic, as well as pantheistic overtones.

Pantheism

From the three hypotheses of panpsychism, IIT and the implicate order, the following collective pantheistic paradigm becomes clear, and the fine-tuning argument clarified.[29]

With this pantheistic paradigm, God is not just a *collection* of cosmos-stuff, but also the integration of it, specifically at the implicate order level. The mind of God unfolds from this integrating substrate as a synergistic presence possessing causal efficacy; that is, a Divine being greater than the sum of the integrating universe.[30] As such, God is more than cosmos-physicality, just as we are more than muscle and blood. This takes pantheism beyond a mere cosmic-wonder to a Divine immanence worthy of worship; (Forrest, 2016, *passim*).

From a Christian perspective, such physicalising of God is not necessarily heretical, in fact, there is no clear-cut assertion in the Bible that God is incorporeal other than "God is Spirit" (John 4:24).[31] However, the Stoics interpreted the ancient Greek *pneuma* (meaning spirit) to include a corporeal element (Jantzen, 1984, pp. 22–23). Indeed, reference to God "as Father, King, Leader, Judge, Shepard, and so on, would suggest, if taken at face value, that God is indeed corporeal." (Jantzen, 1984, p.

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[29] By *collective pantheism* I mean the entire universe is Divine (Oppy, 1997, p. 325n6).

[30] To some extent, this echoes the writings of Pierre Teilhard de Chardin (Teilhard de Chardin, 1986, Epilogue 1).

[31] Also, 1 Timothy 1:17 (invisible); Colossians 1:15 (invisible); Deuteronomy 4:15–16 (lacking form). Third party conscious states are invisible and lacking form to the onlooker; nevertheless, conscious states require a body.

22). Peter Forrest argues that a pantheistic God means that the universe itself is worthy of worship (Forrest, 2016, p. 68).

Based upon panpsychism, IIT and the implicate order, the interconnected universe comprises micro-conscious particles possessing purpose. Such purpose is to transfer information across the universe.[32] Such transmission becomes integrated, exhibiting feedback as well as feed-forward integration, and if maximal, results in an unfolded macro-conscious state; i.e. Φ.[33] Thus, the universe itself becomes a vast macro-conscious state, a Divine first-person universal consciousness possessing causal efficacy;[34] i.e. an intrinsic feedback power into the particle substrate, which then possesses new information for transmission resulting in a new Φ. This progressive looping process advances Φ towards omniscience, what Teilhard de Chardin termed *the Omega Point* (Teilhard de Chardin, 1986, pp. 283–299).[35]

Again, based upon the three hypotheses of panpsychism, IIT and the implicate order, as well as possessing information feedback power, this macro-conscious universe also possesses intrinsic causal power over itself. More specifically, providential causal power over the universe.[36] As such, the universe has an inherent objective purpose to maintain the fundamental constants that enable its Φ.[37] Such maintenance reflects a self-preservation objective which is revealed by an identical propensity with life. Indeed, it is a fundamental characteristic ignited by the survival instinct; even bacteria move away from a harmful environment. Thus, because life is subsumed within the universe, then it can represent a self-preservation lemma for the universal as a whole. Clearly, if collective pantheism means that God is, *inter alia*, the universe, and the universe materially comprises living matter and non-living matter, and living matter has a self-preservation propensity, then God would also likely have that propensity. Consequently, God as the universal consciousness, would have an inherent objective purpose to maintain the fundamental constants that enable its Φ.

The implicate order is the source of the universal constants that are manifested in the explicate order. Change in those constants would be caused by change in the implicate order. Even the slightest change in the value of these constants, particularly the gravitational constant, the fine structure constant or the strong nuclear force, would result in the loss of all life and a cataclysmic change in the state of the extant

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[32] There is considerable evidence of information transmission at the quantum level; i.e. *quantum information theory* (QIT). QIT engages with, *inter alia*, the principles of entanglement and superposition which are the basis of quantum computing. For an introduction to QIT see Michael Nielson and Isaac Chuang on quantum information and computing (Nielson & Chuang, 2000, pp. 1–12).

[33] Although IIT is primarily an explanation of consciousness in biological systems, it has been theoretically applied to non-biological systems. See Koch (2012) on this point.

[34] Just as we are ignorant of what it is like to be a bat, then we are equally ignorant of what it is like to be God. It should be noted that Φ and Divine-Φ are not emergent properties that supervene on their underlying physicality, as they possess causal feedback efficacy into their neural and universe substrates respectively.

[35] Samuel Alexander takes a similar position "…with the whole universe tending towards deity…" (Alexander, 1921, p. 428).

[36] *Providential* on the grounds of religious scripture, as the pantheistic hypothesis does not falsify scripture; on the contrary, it authenticates it and is authenticated by it (Jantzen, 1984, Ch.3).

[37] There is speculation that the fundamental constants of the universe could change (Flambaum, 2007).

universe. Given that the pantheistic god is the universe, then such change would likely be repellent to themself and suggestive of a desire to maintain the constants at their present value. How this is realised by God is beyond our ken, but it would ultimately be within the implicate order.

This universal maintenance objective is evocatively expressed by Moses Maimonides: "If God did not exist, suppose this were possible, the universe would not exist,…the existence and continuance of all forms in the last instance depend on Him,…" (Maimonides, 1904, p. 104).[38]

Individuation

Joanna Leidenhag raises the problem of phenomenological individuation; i.e., the existence of very diverse individual consciousnesses subsumed within a holistic universal consciousness, but still manifesting distinct individuality (Leidenhag, 2018, pp. 551–552). Such individuation is addressed by the above IIT perspective, as micro-conscious particles are information transmitters and do not directly generate macro-consciousness. Consequently, transmission of information can be both diverse and unified simultaneously. The maximally integrating information at the constituent level results in a conscious experience specific to that information. The maximally integrating information at the universal level, which includes those at the constituent level, results in a conscious experience specific to the information of the entire universe. With IIT, conscious experience is identical to the Φ-structure, not information per se. The Φ-structure results from maximally integrating information which is different in total content at the constituent level than at the universal level, despite the universal level including information employed at the constituent level.[39]

Entropy

One concerning issue facing this collective pantheistic hypothesis is entropy based upon the second law of thermodynamics. Entropy states that the universe is slowly heading towards disorder and randomness, ultimately leading to its *heat death* with annihilation of complexity. This would ensure the cessation of all biological life and, for the collective pantheist, the death of God. However, David Bohm's implicate/explicate order hypothesis suggests a different, albeit speculative, possibility. The implicate order is a hidden reality from which the explicate order unfolds and enfolds in a dynamic process over time; that is, the holomovement. Thus,

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[38] This is not to suggest that Maimonides was a pantheist in anyway whatsoever.

[39] Compare this IIT perspective with Philip Goff's *grounding by subsumption* argument (Goff, 2017, Ch.9) He argues that constituent consciousness; e.g. human, are aspects of the universal consciousness. By aspects, he means structured enough to be separate from the universal consciousness, but dependent upon it for existence (Goff, 2017, pp. 225–226).

what manifests as entropy is at the explicate order level indicating the existence of a more fundamental order within the hidden implicate order. This suggests that entropy may not result in the ultimate decay of everything, but give rise to a more complex coherence within the implicate order. Although biological life may face entropic doom, universal integrated information is at the implicate order level, and thus a pantheistic God may survive, albeit a different God than at present.

Pantheistic Teleology

Pantheistic teleology aims to explain how the extant universal constants, that are finely-tuned for life, can probabilistically confirm the pantheistic hypothesis. Above I have explained why a pantheistic god would have a propensity to maintain the universal constants; i.e. divine self-preservation. Indeed, life exemplifies this propensity. It is a ubiquitous tendency, and life is subsumed into the pantheistic God state; i.e. the universe. Moreover, life benefits from this divine propensity, as it is protected from any changes to the universal constants that would challenge its exitance. As a result, a universe with constants conducive to life (U^{Life}) would be more likely given a pantheistic god (P) than without (¬P); that is, $Pr(U^{Life} | P \ \& \ k) > Pr(U^{Life} | \neg P \ \& \ k)$ and the ratio of these likelihoods is greater than 1, and from Bayes' theorem (see above), $Pr(P | U^{Life} \ \& \ k) > Pr(P | k)$ and the pantheistic hypothesis P is confirmed by the existence of this life-conducive universe. Moreover, this universe does manifest universal constants conducive to life; i.e., the evidence is factual, so Bayesian conditionalisation is warranted.

Supplementing the argument from self-preservation, there is an additional teleological claim; specifically, Hans Reichenbach's Principle of the Common Cause; (Reichenbach, 1956, Ch,19).[40]

Above I explained consciousness in terms of IIT which posits that consciousness arises from the maximal integration of information within a system. I argue that such integration can take place biologically within an animal's brain, or non-biologically within the implicate order in the case of divine universal consciousness. *Prima facie*, there appears to be a metaphysical correlation between biological consciousness and divine consciousness. However, such a correlation is a challenge to explain given the apparent difference in their respective substrates – a brain in one case, and the implicate order in the other? In short, both biological and divine consciousness originate from the implicate order. Biological consciousness depends on the universal constants manifested in the explicate order which itself unfolds from the implicate order. Therefore, the source of the constants – and by extension of life and biological consciousness – is the implicate order. Likewise, divine consciousness arises from the same implicate order via maximal integration of information within it. Thus, both

[40] Reichenbach's Principle of the Common Cause states that if two events are correlated and do not causally influence one another, their correlation is explained by a shared common cause. Derivatively, if events A and B are positively correlated due to a common cause C, then observing one increases the likelihood of the other: assuming C, then $Pr(B | A) > Pr(B)$.

biological and divine consciousness share a common ontological cause – the implicate order – and are metaphysically correlated by the informational structure described by IIT.

Having a single ontological source suggests, via the principle of the common cause, that the existence of one increases the probability of the other, provided they are correlated. Indeed, this metaphysical correlation extends beyond IIT, given that the pantheistic god is identified with the universe itself. Therefore, given this shared origin and metaphysical correlation, the existence of biological consciousness increases the probability of the existence of a universal consciousness. Biological consciousness presupposes fine-tuning; i.e. a universe conducive to life. Moreover, divine consciousness is a necessary property of the pantheistic god. From this it follows that fine-tuning probabilistically confirms the pantheistic god, obeying the same Bayesian formality as above.

This argument from the principle of common cause does not present new evidence in addition to U^{Life}, and as such does not increase the probability of the pantheistic hypothesis P. Nevertheless, it does provide additional credence to the teleological argument from pantheism.

Other Gods

Other universes with differing universal constants to that of our universe may harbour finite non-biological conscious beings on the basis of IIT and the implicate order, provided those constants enable those functions and conditions. *Prima facie*, this possibility weakens my pantheistic hypothesis on the basis of life-conducive constants, as non-life conducive constants would equally confirm a pantheistic god on the same basis. However, life-conducive constants are a known reality in our universe, whereas the existence of universes comprising non-life-conducive constants, or zones within an infinite universe, are hypothetical. On the basis of Bayesian conditionalization, this gives a probabilistic advantage to the pantheistic hypothesis based upon the evidence of the life-conducive constants over such hypothetical scenarios.

Despite probabilistic confirmation, the resultant probabilistic value of P (the pantheistic hypothesis) is also dependant on the prior value of P; i.e. $Pr(P|k)$. This value, in terms the degree of belief of subjective probability,[41] will be very variable, and a consensus on its value across the theistic, agnostic and atheistic spectrum unlikely. Notwithstanding, the above probabilistic confirmation does provide a pantheistic explanation of fine-tuning. Moreover, additional evidence may bolster the posterior probabilistic value of P in a progressive Bayesian analysis of the form Richard Swinburne employs (Swinburne, 2004, pp. 111-112).[42] In particular, the evidence of personal and widespread religious experience given that, if pantheism of the form described were true, we would be physically integrated with or subsumed within, a pantheistic God.

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[41] See Donald Gillies (2003, Chs. 4 & 8) on subjective and intersubjective probability.

[42] The posterior value of P is given by the function $Pr(P|e \,\&\, k)$, where e is relevant evidence; e.g. U^{Life}.

The above is a teleological argument for the existence of God; that is, God has an indirect purpose in ensuring the existence of a life-conducive universe, and as there is such a universe, it probabilistically confirms the existence of God, albeit a pantheistic God.

It is an entirely different approach to the omni-God of the Abrahamic religions, where God is seen as the creator of the extant universe. This pantheistic perspective sees the instantiation of the universe as a brute fact or perhaps the result of quantum fluctuations in some permanent vacuum state. The pantheistic God is viewed as the universe with a macro-consciousness unfolding from it; that is, a universal consciousness with the providential wherewithal to maintain the fundamental constants that enable its existence and therefore life.[43]

Prima facie, this teleological argument for the existence of God seems as heartless as a chemistry experiment, with a self-interested God, and preservation of life a mere consequence of Divine self-preservation, or the teleology being just a metaphysical induction. This raises the question of whether God is worthy of worship as Peter Forrest suggests (see above).

Given the intrinsic Divine causal power over itself, this need not be the only objective of this pantheistic God. Perhaps a providential universe harnesses the nature of itself to generate a beautiful world with free conscious beings able to experience the joys of existence. In fact, the pantheist Benedict Spinoza thought exactly this (Spinoza, 2001; 5th Part, Prop. 36c).

This is the vision of the theist, but a cause of scepticism for the atheist, and raises the question of the problem of evil, all topics beyond the scope of this paper.

Conclusion

The multiverse hypothesis as an atheistic riposte to the fine-tuning argument for the existence of God is weak. This is because it is a supposition lacking supporting empirical evidence other than the existence of just one universe, which is our universe.

Although theoretical cosmology does provide some credence for the multiverse hypothesis, it lacks probabilistic force in explaining why our universe is one that is surprisingly conducive to life given the possible value-range of the fundamental constants. This leaves a gap for the theist to assert that a Divine designer was responsible for its creation. However, the predicates of omnipotence, omniscience and omni-benevolence that define God in the Abrahamic religions are very anthropomorphic and lack precision through analogy rather than fact. These anthropomorphic predicates imply the wherewithal to create the universe, but such designating imprecision raises doubts as to the reality of this wherewithal. Moreover, negation of their conjunction could include malevolence rather than benevolence, but the conjunction of predicates would still maintain the inferred wherewithal to create

[43] This pantheistic hypothesis echoes that of Samuel Alexander (1950). Although he argues that the universe evolves towards deity as an emergent quality of the universal consciousness similar to that of biological brains; (Alexander, 1950, Vol.1, Ch.3). However, *emergence* is not applicable to IIT, rather *unfolding* is the preferred descriptor (Tononi, 2023, Fig.5).

the universe. From a comparative probabilistic perspective this neutralises any probabilistic advantage the omni-God has in explaining the Creation.

The omni-God/chance comparison is also problematic given the one-off big-bang instantiation of the universe, as the concept of chance presupposes a frequency scenario rather than a single event. As an alternative, a subjective propensity assessment is equally problematic as there is no comparative to base a judgement on. Quantum fluctuations in a vacuum may provide a theoretical explanation, but it is a rather speculative hypothesis in the context of universe instantiation.

The theistic notion of pantheism seems more compatible with the finely-tuned universe argument given that pantheism generally equates God with the universe. This, of course, would not be a Creation teleology, but rather an assertion of identity. Notwithstanding, David Bohm's *implicate order* hypothesis points to the holistic nature of the universe, in terms of its integrating quantum particles and life-conducive fundamental constants. This could explain the realization of a universal consciousness. It would be the maximal integration of information throughout the implicate order (facilitated by micropsychic quantum particles) that is the source of such a universal consciousness, just as integrated information is likely with animal consciousness, but to a far lesser extent. Indeed, so vast and intensely integrated would this universal consciousness be, that information would amass, and the conscious state move towards omniscience. Such intense consciousness, in combination with causal efficacy, would warrant the predication of *Divine* and be worthy of worship.

The attribute of omnipotence is not applicable, as this pantheistic God would be dependent upon the stability of the fundamental constants that enable its existence; constants that also enable life in the universe. Further, causal efficacy of the universal consciousness would operate within the limits set by the values of the fundamental constants. Nevertheless, this causal wherewithal would permit God to maintain the value-stability of these fundamental constants. The motive for such maintenance being self-preservation, exemplified by the same ubiquitous tendency of life subsumed into the God state; i.e. the universe. Therein lies the teleology, as such maintenance would ensure that the fundamental constants would always be conducive to life. Additionally, this teleological argument is supported by the principle of common cause. This is because biological and divine consciousness metaphysically correlate through integrated information theory, and share an ontological cause; the implicate order. Thus, the existence of one increases the probability of the other. Because these two conscious states have a necessary relationship with the universal constants and the pantheistic god respectively, the existence of these constants probabilistically confirms the pantheistic hypothesis.

The pantheistic hypothesis presented has a conditional relationship with the finely-tuned nature of our universe, if not an initial causal relationship, and as such, the existence of our universe probabilistically confirms the hypothesis. However, this does not ensure a strong belief in pantheism. It is a defeasible hypothesis, but evidence in addition to a finely-tuned universe may well buttress such belief. For example, personal and widespread spiritual experience are evidential elements that may do so, for if the above pantheistic hypothesis is true, then we are all part of that Divine universal consciousness.

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