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THE NECESSARY CONNECTION BETWEEN LAWS OF PHYSICS AND METAPHYSICS

Omer Atilla Ergi*

Abstract: This article examines the need for a comprehensive theory that explains the creation of the universe and the enigmatic behaviours observed in quantum particles. Recent advancements in quantum physics have revealed phenomena in the microscopic and macroscopic realms that challenge conventional explanations based solely on natural laws. This article introduces an argument centred on the concept of "presence of metaphysics in physics" as a means to provide a plausible account for the improbable existence of the universe and the mechanics of the space-time continuum. By incorporating ontological principles in classical physics and quantum mechanics, this proposed model sheds light on the origins of natural laws while also considering the mysterious balance and intricacies observed in micro and macrocosms. Moreover, this article argues that a mere succession of random events guided by mathematical probabilities cannot adequately establish and govern the natural laws that appear to have arisen with the aim of fostering life within the universe.

Keywords: *science*, *theology*, *physics*, *metaphysics*, *astronomy*, *religion*

INTRODUCTION

The difficulties encountered in explaining specific phenomena within the micro and macrocosms through the framework of natural sciences pose a significant question. Are these challenges a result of our insufficient level of understanding required to unravel the mysteries of the universe? Or, alternatively, do certain natural phenomena inherently resist explanation through pragmatic methods of scientific enquiry? Notably, as contemporary sciences, including recent advances in quantum mechanics, continue to progress, the inherent complexity of nature seems to increase. It is plausible to posit that cognitive processes and conscious awareness occupy central roles in the apprehension of the mechanisms inherent in the natural world. The human brain, acting as a remarkable biological processor, endeavours to comprehend the events transpiring in the natural world. Equipped with the capacity to explore, investigate,

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analyse and process data then derive conclusions pertaining to the mechanics of the universe, the human brain generates information that can be substantiated through scientific reasoning and pragmatic thinking. An additional advantage of these endeavours lies in the preservation and transmission of gathered information to future generations for further research. Consequently, these human cognitive abilities, in conjunction with advancing technology, provide an opportunity for humanity to deepen its understanding of the mechanisms governing the universe. Nevertheless, certain phenomena within the universe surpass the limits of human comprehension within the realms of classical mechanics and quantum physics. This necessitates the introduction of metaphysics to the equation, as there are phenomena in the universe that cannot be explained by classical physics. Among these inexplicable phenomena, the origin of the universe, as proposed by contemporary astrophysicists, emerges as particularly inscrutable, positing a Big Bang or an inflationary epoch sparked by an enigmatic mathematical singularity as initiating events. Hence, the enigmatic narrative of the universe commences with the occurrence of the Big Bang.

THE BIG BANG THEORY

According to the standard *Big Bang* model, recognised by the majority of contemporary physicists, the universe came into existence about 13.8 billion years ago.[1] The theory proposes there was a point in time when space-time, as we know it, did not exist. Subsequently emerging from a designated mathematical singularity, the fabric of space-time underwent a process of inception, where it abruptly manifested and commenced rapid expansion, ultimately culminating in the development of the presently observed universe.[2] This scenario implies that physicists possess substantial understanding of the potential mechanisms underlying the occurrence of the Big Bang; however, a significant aspect of this puzzle remains unresolved, leading some to assert that it may indefinitely elude resolution: namely, the enigmatic genesis of the singularity from which the universe originated.

The existence of the postulated singularity necessitates an explanatory framework that must undergo scrutiny by the disciplines of quantum physics, classical mechanics and philosophical principles. Philosophical and classical physical principles, which stipulate that all effects are contingent on preceding causes arising from fundamental interactions, concur in their understanding that causal relationships are fundamental. For instance, the motion of a mass implies the existence of a force that acts as the causal agent. In the context of the Big Bang, the antecedent event that instigated the rapid expansion of space-time is hypothesised to be a singularity characterised by extraordinary attributes such as infinite density and temperature. However, at this juncture, the chain of physical interactions ceases, as classical physics fails to elucidate the cause underlying this singularity, which is responsible for our existence. Nonetheless, our inability to identify this cause does not negate the existence of a cause nor

1 John J. Park, "The Kalām Cosmological Argument, the Big Bang, and Atheism," *Acta Analytica* 31 (2016), https://doi.org/10.1007/s12136-015-0273-9.

2 Ibid.

does it resolve the quandary of the necessity for causality. The challenge lies in discerning the cause that precipitated the singularity, which, in turn, triggered the Big Bang, as it appears this cause may transcend the realm of the physical. Nevertheless, scientific reasoning posits the existence of a preceding phenomenon that initiated the singularity, subsequently setting in motion the genesis of the space-time continuum. While conventional scientific approaches may fail to ascertain the elusive cause, the existence of this cause remains beyond doubt. Proposing an argument akin to "it occurred without a known explanation" lacks verifiability through scientific methodologies. Empirical observations establish that, regardless of the rapidity of space-time's expansion, the quantity of matter and energy it encompasses is finite. Consequently, no matter how extensively we explore the expanse of space, it shall forever remain bounded. This argument finds support through an analogy illustrating a hypothetical circle devoid of boundaries, which is mathematically untenable, as a circle inherently possesses a finite radius. Applying similar reasoning to space, although the observable universe may lack perceptible edges, it cannot extend infinitely as it inherently possesses a finite radius. Therefore, a universe undergoing expansion must have experienced a specific point in time when its expansion commenced, necessitating a cause for its existence. To clarify this, Sean Carroll argues that "The *Big Bang* is a moment in time, not a point in space."[3] Consequently, it can be inferred that the Big Bang transpired not within a spatial point, but within a moment in time. As a result, the existence of a causative factor becomes imperative for scientific acknowledgement, even if it was to manifest in a metaphysical form.

Irrespective of the perspective, the presence of such a cause is an essential requirement, prompting scientists to undertake diligent efforts in pursuit of this elusive initiator. In the ongoing quest to resolve the quandary surrounding the primordial singularity, certain contemporary theories emerge, challenging its existence altogether and offering an alternative hypothesis. These theories postulate the existence of an infinitely empty and timeless spatial state preceding the Big Bang, where a form of exotic radiation is proposed to have gradually accumulated in density over time, ultimately serving as the trigger for the onset of the Big Bang. This concept finds its foundation in one of the theoretical frameworks of string theory, where proponents of this theory postulate that the fundamental constituents of the universe consist of infinitesimally small, one-dimensional strings that exhibit vibrational patterns characterised by loop-like oscillations.[4] According to certain scientists, a variant of string theory challenges the notion of a pre-Big Bang mathematical singularity by proposing an alternative perspective where the universe potentially existed as an infinitely vacant spatial realm, until the presence of exotic energy within it instigated the occurrence of the Big Bang.

Despite the alluring nature of the hypothesis, its validity can be called into question through fundamental philosophical reasoning, as it exhibits several inherent inconsistencies. First, the proposal of an eternally existing empty space presents a notable challenge. A spatial entity

3 Chardynne Joy H. Concio, "What was going on Before the Big Bang," *Science Times*, April 20, 2019, https://www.sciencetimes.com/articles/20512/20190420/what-was-going-on-before-the-big-bang.htm.

4 Vicky Stein and Charlie Wood, "What is String Theory," *Space*, last modified January 21, 2022, https://www.space.com/17594-string-theory.html.

devoid of a temporal origin is inconceivable, as it would preclude the possibility of reaching the present moment within a timeless universe. In essence, the occurrence of the Big Bang at a specific point in time would be impossible within a universe devoid of temporal beginnings. In other words, in a timeless universe, the notion of retracing one's steps to a starting point would be unattainable, thereby rendering the arrival at the present equally impossible. Consequently, given the universe began at a specific moment in time, it inherently possesses a temporal origin.

The second problem with the hypothesis is the gradual densification of the proposed exotic energy. Philosophically speaking, it would be impossible to ask a question like "how long did it take for this floating energy to densify?" in a medium where there is no concept of time. Therefore, an infinite universe that has no beginning in time cannot be sustained with theoretical physics or philosophy. The hypothesis is analogous to a bottomless pit where, if you were to drop a stone, it would never hit the bottom. Such a pit cannot be envisioned since there is a point at the top where the stone begins to fall. There must then be a bottom where it will eventually come to stop. Consequently, the theory of timeless space can be refuted with philosophically sustainable arguments. Therefore, the question "what caused the Big Bang?" remains unanswered.

The multiverse theory is another widely discussed hypothesis within the realm of cosmology that endeavours to explain the genesis of our universe. According to this proposition, our universe represents a minute fragment of an extensive construct that conceivably encompasses innumerable universes. While the multiverse theory engenders controversy among physicists, it enjoys popularity owing to its conjecture that our universe's existence appears improbable. This implies that the intricate preconditions necessary to facilitate the sustenance of life could not have arisen purely by chance. The multiverse theory posits that the meticulous design evident in our universe may have arisen by chance if it was an integral part of a larger framework perpetually generating countless universes. Within this context, it becomes plausible to surmise that one of these universes could possess the suitable conditions necessary for sustaining life. However, while the multiverse theory holds philosophical potential, it does not resolve the quandary of infinite regress and the underlying principle of causality. Another philosophical predicament pertains to the finitude of space-time, as an actual infinitude cannot feasibly exist. All entities existing within space-time are contingent, meaning their existence relies on external factors. The proposed larger construct put forth by the multiverse theory fails to address the issue of contingency, implying it too necessitates an origin. Furthermore, the assertion that our universe accidentally evolved into a hospitable habitat for life is unsustainable.

Consider a hypothetical scenario in which a manned mission to Mars conducted by scientists leads to the serendipitous discovery of a metallic cube nestled within the canyons of the planet. The surface of this enigmatic cube exhibits inscriptions that appear to belong to an unfamiliar language, thereby demanding a plausible account for its origin. Could it be conceivable for scientists to posit a theory suggesting the cube is one among the countless meteorites that have bombarded Mars' surface over a span of 4.6 billion years? Although meteorites are typically predominantly iron-nickel composition alongside trace quantities of various minerals and

exhibit irregular shapes, it remains an inexplicable coincidence that this specimen assumes the form of a cube, adorned with distinctive inscriptions. Alternatively, is it more reasonable to argue that the cube was intentionally crafted by an extraterrestrial intelligence? This question lies at the heart of the debate surrounding the genesis of a finely tuned universe capable of supporting life. Can such a universe, meticulously designed to foster life, plausibly emerge by chance? Perhaps it is at this juncture where metaphysics, comprising transcendental principles that elude empirical testing and quantification, warrants incorporation into the equation. Such an ontological component possesses the potential to explain the phenomena that initiated the formation of the perplexing energy or mathematical singularity that precipitated the occurrence of the Big Bang.

Undoubtedly, the inception of the space-time continuum stands as an exceptionally intricate phenomenon in the annals of cosmic history. It becomes apparent that comprehensive elucidation of this event necessitates the application of metaphysical principles, as the purview of metaphysics transcends the realms of causality mechanics that instigated the formation of space-time. The pervasive influence of metaphysics manifests not only during the genesis of the universe but also permeates the fabric of the quantum realm. Its presence remains conspicuous even during the formative stages of the early universe, particularly during the emergence of subatomic particles. According to scientific consensus, during the initial instance of the Big Bang, the universe existed in a state of tremendous heat and density, leading to the unification of the four fundamental forces. Subsequently, within an infinitesimal span of time, the universe underwent exponential expansion, transforming from a subatomic particle-sized entity to a scale comparable to that of the Solar System. This expansion transpired symmetrically, resulting in the separation of the weak nuclear force from the remaining forces. This demarcation facilitated the formation of quarks, the elemental constituents of the quantum domain. Unravelling the subsequent unfolding of events represents a formidable challenge within the realm of physics, as quantum physicists relentlessly explore these phenomena.

QUANTUM PHYSICS

Quantum physics, a branch of physics concerned with elucidating the workings of subatomic entities, offers a theoretical framework for understanding these phenomena. Its development as a discipline occurred gradually during the early 1900s, propelled by mathematical theories and empirical observations. Throughout the years, experimental investigations and observations have incontrovertibly revealed the incompatibility between quantum physics and classical physics. Thus far, endeavours aimed at formulating a comprehensive theory that encompasses all fundamental aspects of the universe, often referred to as a “theory of everything,” have yielded no empirically verifiable outcomes. Among the leading contenders for this unifying framework is string theory, which posits that all particles constituting the fabric of the universe are composed of vibrating strings with one or two dimensions. These strings are regarded as the tiniest building blocks of matter, confined to a scale known as the Planck length, beyond which physical matter cannot be further subdivided.

Despite physicists proposing five internally consistent versions of string theory, none have furnished testable predictions that can be experimentally verified.

The explanations provided by conventional physics concerning the dynamics of the macroscopic universe have traditionally relied on empirical data and observational evidence. For instance, special relativity, supported by measurements of the velocity of light, established the fundamental principle that no entity within the universe can surpass the speed of light. The theories encompassing classical mechanics, ranging from Newton's laws of motion to Einstein's general relativity, were effectively corroborated through rigorous experimental tests and meticulous observations. However, the advent of quantum mechanics has introduced a realm of profound complexity, leading numerous quantum physicists to contend that one who claims to comprehend quantum physics has not genuinely grasped its intricacies. It can be posited that standard physics, in its essence, adheres to the principle of Ockham's razor, which advocates for the elimination of unnecessary information from the equation as a means of attaining a more direct path toward understanding the workings of nature.[5] The realm of the quantum world, in stark contrast, presents a profound challenge as its complexities only intensify with each new discovery. The renowned assertion, "God does not play dice," attributed to Albert Einstein, encapsulates his scepticism towards the nature of quantum physics. Einstein's statement reflects his inclination towards a deterministic framework, suggesting the same determinism observed in the macroscopic universe should extend to the quantum realm. However, Einstein later modified his stance in a letter where he expressed the view that "God tirelessly plays dice under laws which he himself prescribed." This modification implies a recognition of the probabilistic nature inherent to quantum phenomena, where events unfold in accordance with prescribed laws of probability.[6] Einstein's decision to rephrase his statement may have been motivated by the empirical evidence revealing unexpected characteristics exhibited by quantum particles, including phenomena such as wave-particle duality, superposition and quantum entanglement.

In 1927, Werner Heisenberg introduced further perplexity to the field of quantum physics through the formulation of the uncertainty principle, which posits that the simultaneous determination of a particle's position and velocity is inherently unattainable.[7] The quantum realm represented an enigmatic domain where particles exhibited behaviour that appeared inherently unpredictable. Attempting to address the inexplicable behaviour of quantum particles, John Archibald Wheeler stated:

> Probability? Yes. A definite forecast? No. Einstein could be unhappy with "God plays dice"; but Bohr could tell him jokingly, "Einstein, stop telling God what to do." "If no identifiable

5 William H. Jefferys and James O. Berger, "Ockham's Razor and Bayesian Analysis," *American Scientist* 80, no. 1 (1992).

6 Mindy Weisberger, "'God Plays Dice with the Universe,' Einstein Writes in Letter about his Qualms with Quantum Theory," *LiveScience*, June 12, 2019, accessed November 5, 2022, https://www.livescience.com/65697-einstein-letters-quantum-physics.html.

7 Howard Percy Robertson, "The Uncertainty Principle," *Physical Review* 34, no. 1 (1929): 163.

> machinery is at hand to tell the lone photon which way to go, then why not simply say of the route it actually takes, Allah willed it."[8]

While Wheeler's argument is grounded in the idea that invoking metaphysics into the equation simply because we lack understanding is unwarranted, it also becomes apparent that incorporating the notion of absolute randomness governing the quantum realm poses a challenge to fundamental principles of philosophy and human reason. Numerous arguments underpin this contention. First, it is observed that particles manifest behaviour consistent with our assumptions when subjected to observation and measurement, displaying characteristics akin to particles. However, in the absence of observation, their behaviour assumes a wave-like nature, implying an autonomy inherent within particles, a phenomenon referred to as wave-particle duality. Here, the "observer effect" assumes significance, where the acts of observation and measurement endow the quantum world with determinism. The cause underlying the observer effect remains unknown to scientists. The intriguing observation emerges that, despite the absence of any apparent connection between human consciousness and the realm of quantum physics, these two domains appear to exert mutual influence on one another. In simple terms, the act of human observation appears to compel particles, such as photons and electrons, to adopt a specific, predetermined behaviour. Given the implausibility of particles possessing inherent knowledge of being under observation and instantaneously altering their behaviour accordingly, it becomes reasonable to posit that an external factor is responsible for their dual wave-particle nature. This causative factor may reside within the uncharted domain of metaphysics, thus far undetected. Consequently, metaphysics may potentially constitute the determinant that governs the seemingly indeterministic behaviour exhibited by particles.

Another argument challenging the concept of absolute randomness within the quantum realm revolves around the principle that random behaviour cannot give rise to deterministic outcomes. To illustrate this point, consider an analogy where scientists examine the minutest components of a meticulously functioning wristwatch. Observations of these individual components may reveal apparent indeterminism in their behaviour. However, based on such observations, it would be untenable to conclude that absolute randomness underlies the functioning of the watch's smallest elements, since randomly behaving parts cannot coalesce to form a precisely functioning mechanism. Drawing a parallel with this analogy, the macro universe operates as a deterministic system governed by classical mechanics and measurable laws of physics. Notably, all entities within the macro universe comprise quantum particles. Considering that minuscule constituents of a large-scale deterministic system cannot exhibit entirely random behaviour; it follows that the quantum realm must also contain an element of determinism. Alternatively, it is conceivable that the quantum world operates in a deterministic manner that has yet to be fully comprehended by scientists.

In corroboration of this contention, notable advancements in the field of quantum physics, recognised through the Nobel Prize in Physics, have revealed intriguing phenomena that defy

[8] John Archibald Wheeler, "The Computer and the Universe," *International Journal of Theoretical Physics* 21 (1982).

conventional explanations within standard physics. Nobel laureates Alain Aspect, John F. Clauser and Anton Zeilinger were honoured in 2022 for their ground-breaking experiments involving entangled photons. These experiments have illuminated the existence of enigmatic connections within the quantum realm that persist irrespective of spatial separation. Such connections transcend the boundaries of conventional physics, defying traditional understanding and prompting reassessment of the underlying principles that govern the quantum world.[9] The outcomes of their investigations have unequivocally demonstrated the enduring entanglement of particles, regardless of astronomical separations. Remarkably, the act of measuring one particle instantaneously determines the measurement outcome of the other, establishing a precise correlation between their physical properties such as spin, momentum or position. For instance, when the measurement of one entangled particle reveals a down spin, the other particle will inevitably exhibit an up spin, owing to the entanglement effect that generates a total spin referred to as zero spin. This peculiar behaviour, famously characterised by Einstein as "spooky action at a vast distance," has now been definitively substantiated through experimental verification. Intriguingly, this concept seems to challenge the tenets of special relativity, which asserts that the speed of light sets an insurmountable limit to the transfer of information or influences. Notably, the entangled particles remain intricately connected even across vast distances, thus seemingly contravening the constraints imposed by the principle of special relativity.

Given the absence of conventional information exchange between entangled particles, the nature of their connection remains shrouded in mystery. Furthermore, this investigation hints at the non-local realism of the universe, suggesting it constitutes a cohesive entity of undivided reality. As proposed by David Bohm, the notion arises that the entire universe must, at a highly precise level, be viewed as a single indivisible unit. The Implicate Order theory, put forth by Bohm, encapsulates an exceptionally comprehensive cosmic perspective that interconnects all aspects of existence. Bohm's theory underscores the fundamental concept of an unbroken and seamless wholeness characterising the totality of existence. This concept postulates an indivisible and continuous flow, transcending perceived boundaries or divisions.[10]

Nonetheless, the mechanism facilitating instantaneous communication between particles separated by billions of lightyears remains elusive. It is plausible that the presence of as-yet-undiscovered determinism, beyond the purview of current physics, is at play in this phenomenon. Whether scientists embrace the idea that metaphysics is the missing link offering explanations for particle duality, superposition, quantum entanglement and quantum gravity, the undeniable reality is that quantum physics poses a formidable challenge to materialistic scientific frameworks. It becomes increasingly evident that an exclusively materialistic approach falls short in comprehensively elucidating the workings of the universe. In fact, some physicists argue that an unknown entity intervened during the creation of space-time, matter in

9 Nobel Prize Outreach, "The 2022 Physics Laureates," The Nobel Prize, accessed October 11, 2023, https://www.nobelprize.org/prizes/physics/2022/summary/.

10 SAND, "David Bohm, Implicate Order and Holomovement," *Science and Nonduality*, October 29, 2019, accessed July 13, 2023, https://www.scienceandnonduality.com/article/david-bohm-implicate-order-and-holomovement.

the immediate aftermath of the Big Bang, breaking particle symmetry and introducing a level of complexity that transcends our current understanding.

THE PRINCIPLE OF SYMMETRY

According to the law of symmetry, the Big Bang should have created equal amounts of matter and antimatter.[11] Remarkably, the contemporary universe predominantly consists of matter, with antimatter being notably scarce, a fact that presents an intriguing puzzle. The principle of symmetry, a fundamental law, postulates the existence of parity in the creation of particles during the epoch of the Big Bang, stipulating that matter and antimatter should always arise in pairs. Paradoxically, if this principle of symmetry was strictly adhered to during the Big Bang, the emerging universe would have undergone self-annihilation even before its formation. The rationale behind this inference lies in the mutual annihilation that occurs when matter and antimatter come into contact, resulting in their complete annihilation and the release of pure energy. Consequently, this scenario precludes the possibility of the formation of the currently observable universe. Thus, the crucial question arises: what factors led to the particle asymmetry that defied the principle of symmetry in the early universe, thereby enabling an exceedingly minuscule fraction of matter to persist and shape the universe as we observe it today?

As posited by physicists affiliated with CERN, an enigmatic entity, whose nature remains unknown, may have intervened during the early stages of the universe, leading to the preferential decay of oscillating particles as matter more frequently than as antimatter.[12] An alternative viewpoint proposed by other physicists suggests that, for reasons yet to be understood, matter was favoured over antimatter. Both perspectives converge in emphasising the existence of an unidentified cause that orchestrated the optimal conditions for the universe's formation. Intriguingly, the nature of this intervention eludes comprehension within the confines of standard and quantum physics. Once again, some form of unidentified causality assumes a necessary role, as the bias displayed towards matter in relation to antimatter necessitates a mechanism of preference. Consequently, such a scenario implies the presence of metaphysics or an unknown cause. This enigmatic phenomenon persists throughout the formation of the universe, adding further complexity to the intricate tapestry of cosmic evolution. This unfathomable phenomenon coerces many astronomers and physicists to postulate that the universe exhibits remarkable improbability, owing to compelling evidence indicating it has undergone a process of fine-tuning. This conclusion is primarily supported by the observation that the universe manifests characteristics and conditions that appear finely calibrated to allow for the emergence and sustenance of life.

11 "The Matter-Antimatter Asymmetry Problem," CERN, accessed December 2, 2021, https://home.cern/science/physics/matter-antimatter-asymmetry-problem.

12 Ibid.

FINE-TUNING

Theoretical physicists assert that the concept of fine-tuning exposes the meticulous adjustment of various parameters in the universe to enable the emergence and preservation of life. This deduction is supported by observational data, which indicates the current state of the universe deviates significantly from what would be expected in the absence of deliberate precision. The remarkable order and intricate organisation observed within the universe are deemed improbable outcomes if they were to arise solely from a state of primordial chaos. Empirical investigations provide evidence of a fine-tuning phenomenon, where the universe displays a remarkable calibration that facilitates the generation of essential components and conditions necessary for the existence of life.[13]

The current state of the universe challenges the notion that processes occurring within it are purely natural, as the intricate formation and organisation of the universe imply the existence of laws that transcend our current understanding. It is plausible that metaphysical causation, operating in conjunction with physical laws, govern the universe and possess the capacity to deviate from them when necessary to achieve the desired outcome, namely the emergence of life. This mysterious causality, operating through an enigmatic influence, eludes detection by our scientific methodologies, yet its existence assumes philosophical and scientific necessities. This assertion stems from the observation that the precise design of the universe cannot be accounted for by alternative means. Astronomical evidence, suggesting the universe originated from a chaotic bang, necessitates the recognition that the order and complexity we observe could not plausibly arise from chaos alone. The inference drawn is that external factors or interventions must be at play, acting in a manner that reverses disorder to give rise to the observed structured and finely tuned state of the universe.

In physics, the second law of thermodynamics states that entropy increases with time. The general definition of entropy is that it is a physical property associated with disorder.[14] Succinctly stated, the principle of entropy asserts that the natural course of events in the universe involves progression from order to disorder. This can be observed in various phenomena, such as the aging and mortality of living organisms, the erosion of mountains, the decomposition of plants and the culmination of stellar lifecycles with spectacular supernovae. Nevertheless, a remarkable deviation from this principle occurred during the formation of the universe, where order emerged from chaos. To illustrate this concept, envision a scenario where all the components necessary to construct a functional computer, right down to its smallest electronic parts, are placed inside a bag and vigorously shaken. Astonishingly, on opening the bag, the components have spontaneously arranged themselves in such a way that a fully operational device has materialised. The probability of such an occurrence is unfathomable unless we reside within a fantastical realm where the laws of physics are suspended. Nonetheless, this is precisely what transpired during the universe's formation. From a

13 Atilla Grandpierre, "The Fundamental Biological Activity of the Universe," in *Eco-Phenomenology: Life, Human Life, Post-Human Life in the Harmony of the Cosmos*, ed. William S. Smith, Jadwiga S. Smith and Daniela Verducci (Springer, 2018), 131-32.

14 Alfred Wehrl, "General Properties of Entropy," *Reviews of Modern Physics* 50, no. 2 (1978).

singularity characterised by infinite density and temperature, a universe emerged governed by laws specifically orchestrated to facilitate the emergence and sustenance of life. Such a scenario necessitates the involvement of an external cause that transcends mere physical laws and is independent of contingent factors.

CONCLUSION

In the scientific community, it is anticipated there may arise dissenting voices challenging the validity of metaphysics, asserting that these principles are merely conceived to account for gaps in scientific understanding. It is crucial, however, to emphasise that metaphysics does not represent a hypothesis intended to bridge knowledge gaps. On the contrary, its purpose lies in elucidating the underlying mechanics governing the laws of nature. These laws, whether quantifiable or not, predate the existence of humanity and were not designed or established by scientists; hence, they remain immutable and beyond human amendment. Consequently, the proposition that the precise laws and order observed in the universe emerged solely from a chaotic event, such as the Big Bang, warrants scrutiny from scientific and philosophical vantage points.

The contention that natural laws spontaneously establish and enforce themselves lacks empirical foundation within the realm of science. Moreover, the evolution of the universe unfolds along a discernible trajectory, ultimately culminating in the emergence and perpetuation of life. Analogous to a seed progressing through sequential stages of sapling, tree and fruit-bearing entity, the universe follows a comparable course and, against formidable odds, fine-tunes itself to develop into a habitable system capable of fostering and sustaining life.

Such a remarkable process and transformation transcend explanation through random occurrences and happenstance causality. Fundamental principles of philosophy posit the involvement of an external agent, an enigmatic entity beyond the confines of conventional physical laws. This entity necessitates a non-contingent existence, distinct from the contingent laws governing the universe. Additionally, the well-established notion that the entire fabric of space-time and matter hinges on external factors reinforces the requirement for an entity whose existence is not contingent but rather essential. It is plausible that this entity, governing the laws of physics and metaphysics, constitutes the underlying catalyst that brought the universe into existence and subjected it to a meticulous process of fine-tuning, culminating in the emergence of life. Consequently, scientific research will never come to an absolute conclusion where every detail of existence could be understood through the laws of nature. In conclusion, the perpetual pursuit of truth shall persist unabated until the unearthing or acceptance of an ultimate causative factor, as articulated by Nicolaus Copernicus,[15] a philosopher endeavours to ascertain the truth in all matters, within the bounds permissible to human reason as bestowed

[15] Sheila Rabin, "Nicolaus Copernicus," in *Stanford Encyclopaedia of Philosophy*, ed. Edward N. Zalta and Uri Nodelman, Winter 2023 edition, https://plato.stanford.edu/archives/win2023/entries/copernicus/.

by the Divine. As our scientific enquiries progress, nature manifests increasing complexity, underscoring an intrinsic correlation between the principles of physics and metaphysics.

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