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[Sameer Al Khawaja](#)*

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Article

On the Origin and Temporally Infinite Cosmos: A Modern Reappraisal Through Quantum Theory and the Kalam Argument

S Al Khawaja

Coventry College, 50 Swanswell St, Coventry, CV1 5DG, UK; salkhawaja@coventrycollege.ac.uk

Abstract

This article explores the origin of time and the universe through the integrated lenses of modern cosmology, alternative quantum theories, and the Kalam Cosmological Argument. It challenges the notion of a temporally infinite cosmos and critiques materialist interpretations that deny a beginning to time. Drawing from classical Islamic philosophy – particularly Al-Ghazali's arguments on creation *ex nihilo* and Divine Will – the paper incorporates contemporary insights from quantum cosmology, such as the Hartle-Hawking no-boundary proposal, loop quantum cosmology, and philosophical developments in the Kalam argument. It argues that time is a contingent feature of the universe, emerging with creation, and not an eternal backdrop. The discussion highlights the epistemological limits of physics in addressing metaphysical origins and underscores the necessity of philosophical and theological perspectives in cosmological discourse.

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Introduction

The question of whether the universe had a beginning is not only a scientific puzzle, but one of the oldest philosophical and theological debates in human history. Modern cosmology has revealed that time and space are not eternal backdrops but features of the universe itself – meaning that if the universe began, then time began with it. This idea challenges the older view that the cosmos has always existed and invites a deeper reflection on what it means for anything to “begin” at all.

Today, popular discussions often treat science as if it can answer every question about origins. But physics can only describe *how* the universe behaves once it exists – it cannot explain *why* it exists in the first place, or what caused the universe (and time itself) to come into being. These are metaphysical questions, not scientific ones. The limits of physics are not a weakness of science, but a reminder that some questions lie beyond measurement and experiment.

This article revisits the origin of time and the universe by bringing together insights from modern cosmology, quantum theory, and the Kalam Cosmological Argument (KCA), a philosophical case for a universe with a cause. It also draws on the classical Islamic perspective of the theologian Al-Ghazali, who argued that time is created rather than eternal – a view remarkably consistent with the findings of contemporary cosmology.

By exploring both scientific and philosophical reasoning together, we can move toward a clearer understanding of why the universe began, why time itself is not eternal, and why the question of origins ultimately leads beyond physics to a deeper metaphysical foundation.

Modern Cosmology and the Beginning of Time

Modern cosmology supports the view that the universe had a beginning. According to the Big Bang theory, the universe expanded from an initial state of extremely high density and temperature

around 13.8 billion years ago. This event was not an explosion *in* space – it was the beginning of space itself. When the universe came into existence, time came into existence with it.

Evidence for this beginning is compelling. The expansion of space, first observed by Edwin Hubble, shows that galaxies are moving away from each other. If we run this process backwards, space contracts toward a starting point. The discovery of cosmic microwave background radiation – a faint echo of the early universe – also confirms that the cosmos had a hot and dense origin.

Some materialist interpretations suggest that the universe might be eternal or part of an endless cycle, but these claims face two problems: they contradict the best current evidence, and they assume time exists independently of the universe. Modern physics, however, indicates that time is not a backdrop that exists on its own – it is part of the physical universe. If the universe began, then time began as well.

This is why the Big Bang does more than describe a physical process. It pushes us towards a deeper philosophical question: if time itself began, then the cause of the universe must lie beyond time – and therefore beyond physics. This is the bridge that leads us from cosmology to quantum theories of the beginning.

Short Glossary (for Clarity)

Singularity – The point at which space and time trace back to a beginning.

Imaginary time – A mathematical concept used in physics to smooth equations; not real, lived time.

Quantum cosmology – Attempts to describe the earliest stage of the universe using quantum theory.

Transcendent – Existing beyond the physical universe and its laws.

Quantum Cosmology and the Limits of Scientific Explanation

While the Big Bang strongly suggests a beginning, some physicists have proposed quantum models that attempt to describe what happened “before” the universe existed. These models do not necessarily deny a beginning, but they try to explain it without referring to a cause outside the universe itself.

One of the most famous is the **Hartle-Hawking no-boundary proposal**. It suggests that in the earliest stage of the universe, time behaves more like space – which removes the sharp edge of a beginning by replacing it with a smooth, rounded geometry. However, this “imaginary time” is a mathematical tool, not a physical form of time that we actually live in. So the proposal does not truly remove the beginning – it simply reformulates it in a different mathematical language.

Another approach is **loop quantum cosmology**, which replaces the Big Bang with a “quantum bounce,” suggesting that a previous universe collapsed and then rebounded into our own. However, this model still assumes laws of physics, quantum structure, and a pre-existing mathematical framework. It does not explain the origin of those laws – it merely shifts the beginning further back.

A third perspective, found in interpretations like **QBism (Quantum Bayesianism)**, claims that the universe’s “beginning” is not an objective event but the point at which observers start assigning meaning to observations. However, this relies on a philosophical stance that denies observer-independent reality, which most physicists and philosophers do not accept.

What all these quantum models have in common is that they stay within the boundaries of physics – and physics can only describe systems once they already exist. It cannot explain why there is a universe rather than nothing, or why time and laws of nature exist at all. Recognising this limit prepares the ground for the next step: if science can tell us *that* the universe began, philosophy must tell us *why*.

The Kalam Cosmological Argument Revisited

If the universe began to exist, then it cannot be the cause of its own existence. Everything that begins requires a cause, because coming into existence means moving from non-being to being — and non-being cannot generate anything. This principle is not merely a rule of science; it is a rule of reason.

The Kalam Cosmological Argument captures this logic in a simple structure:

Whatever begins to exist has a cause.

The universe began to exist.

Therefore, the universe has a cause.

Some objections claim that the universe could still be eternal, but an infinite past is logically impossible. An actual infinite cannot be completed step by step — yet time would have had to “complete” an infinite number of moments before arriving at today. This would be like trying to climb out of a bottomless pit: no matter how long you climb, you would never reach the top. The fact that we have reached the present moment is proof that the past is not infinite.

Even thought experiments such as Hilbert’s Hotel — an imagined hotel with infinitely many rooms that can still take more guests — demonstrate how an actual infinite leads to contradictions. If a true infinite past existed, we would face the same paradoxes in reality, not just in imagination. The finitude of the past is therefore a rational necessity, not just a scientific conclusion.

Once we recognise that the universe began to exist, the nature of its cause becomes clearer. The cause must be outside time (since time itself began), outside matter (since matter began), and outside the physical universe entirely. Such a cause cannot be a mechanical or unconscious process, because unconscious processes operate *within* time. The cause must therefore be timeless, immaterial, and capable of choosing to create — which means it must possess will.

This is why the Kalam Argument points not merely to a “first cause,” but to an intentional Creator.

Al-Ghazali’s Contribution in Light of Contemporary Thought

The philosophical insight that time itself is created, rather than eternal, appears long before modern cosmology. Classical theologians argued that a world with a beginning does not require a “moment before” creation, because time is part of the created order. To ask what came “before” creation is to mistakenly assume that time exists independently of the universe — a category error that modern physics now confirms.

This view stood in contrast to the Aristotelian tradition, which held that the universe had no temporal beginning and existed eternally as a necessary consequence of a first cause. The theological response rejected this idea of a mechanically emanating cosmos and instead grounded creation in will — meaning the universe exists because it was *chosen* into existence, not because it had to exist.

This shift from necessity to intention is philosophically significant. A timeless cause could only produce a temporal effect if it acted by choice, not by automatic consequence. The beginning of the universe, then, is not a mechanical event but a deliberate one. Contemporary cosmology, by showing that time and matter have a beginning, has indirectly vindicated this insight: a beginning requires intention, not merely power.

In this way, the classical argument anticipated a key lesson of modern physics — that time is not an independent backdrop, but part of creation itself.

Philosophical and Theological Implications

If the universe began to exist, and time itself is part of that universe, then the cause of the universe must exist beyond time, space, and matter. This places the cause outside the physical order entirely — transcendent rather than natural. Nothing within the universe can explain the origin of the universe, just as a story cannot explain the existence of the author who wrote it.

This also means the cause cannot be a blind or automatic force. Mechanical causes operate within time — they require a “before” and “after” to trigger them. But a timeless cause has no sequence, no waiting, and no compulsion. A timeless being does not create because it is forced to, but because it chooses to. The decision to create is an expression of will.

Therefore, a beginning does not merely point to a first cause — it points to a *free* cause. The source of the universe must be capable of intention, capable of choosing when to bring a temporal world into being. A timeless, immaterial, transcendent, and willful cause is not a feature of the universe — it is something categorically beyond it.

In this light, the origin of the cosmos is not simply a scientific puzzle, but a metaphysical signpost. The beginning of time itself points beyond physics to a reality that surpasses the physical, and to a cause whose nature is far closer to mind than to matter.

Conclusions: Towards a Unified Understanding of Time and Creation

Modern cosmology shows that the universe — and time itself — had a beginning. Quantum models do not remove that beginning; they only describe it in different mathematical terms. And once we accept that the universe began to exist, reason compels us to seek a cause beyond the universe. A timeless effect requires a timeless cause, and a timeless cause can only act through intention, not mechanical necessity.

This means that the source of the universe is not a physical process but a transcendent will — something capable of choosing that the universe should exist. Far from weakening the case for a Creator, modern physics has made it stronger: by showing that time and matter are not eternal, it has reopened the door to metaphysics and to a deeper explanation of origins.

If time began, then there was no “moment” before creation — there was only the reality that brought time into being. And whatever can originate time must stand beyond it. The beginning of the cosmos is therefore not just a scientific discovery, but a pointer beyond the physical world to a necessary, intentional, and transcendent cause.

In the end, the question is no longer whether the universe had a beginning, but what — or rather *Who* — stands beyond that beginning.

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