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Time: A Dimension We All Live In

We measure time with high precision, but still we don’t understand exactly what time is? One well-explored idea is that time is a consequence of causality. For causality to make sense, you need an order in how things happen.

Aneela Fatima | University of Agriculture Faisalabad, Pakistan | Published: 14th April 2026
aneelafatima369@gmail.com | Position: e.g., Undergraduate Student

Introduction

The nature of time has disturbed thinkers since the earliest days of human thought, as philosophers and scientists have long debated its true essence. Most agree that time is fundamentally connected to movement and change; without sequence of events replacing one another, the very idea of time disappears.

But another possibility is that time arises from something more fundamental. We can say that time is emergent. This is why you sometimes hear physicists say “Time is an illusion” (Barbour, 1999) because it might arise from deeper reality. But what is this deeper reality?

Time in motion: How physics explains its nature

Time as we experience it is closely related to change (Rovelli, 2018). If you took two photographs with no difference between them, you can’t say whether time has passed. This shows that time is understood by motion and variation in physical systems.

In classical physics, as described by Isaac Newton, time is absolute (Newton, 1687). This means that time passes at the same rate everywhere, if the state of the universe is known at one moment, its future evaluation can be predicted. Time in this sense acts as constant parameter that tracks the progression of events. However, this view was changed by Albert Einstein by his theory of General Relativity. In relativity, time is not absolute; it depends on frame of reference (Einstein, 1915). The passage of time depends on motion and gravitational fields.

Another important concept of time in physics is its direction, referred to as “arrow of Time” which is closely related to Entropy and Second Law of Thermodynamics which states that entropy of an isolated system always increases over time. This increase in entropy provides a physical explanation for unidirectional movement of time—from past to future—rather than reverse (Eddington, 1928). From this perspective, time may be interpreted as the increase in possible states of the system.

The Scientific Conflict: Quantum vs. Reality

In classical physics, if the state of the universe is known at one moment, its future is completely determined by that state. every other later time is not independent of that state. They’re all completely slaved in this sense, because universe behaves like a predictable machine, often described by a clockwork that there’s no freedom (Laplace, 1814). However, in quantum mechanics we cannot know more than what is this basic description, which is given by the wave function even for a single particle even if you know everything that can be known about a single particle, or the universe. you cannot predict the future like we could do in classical physics. Instead, quantum theory provides probabilities rather than certainties. so, this allows us to understand physical reality. In classical physics, objects persist through time, simply changing their state from one moment to next.

However, in quantum mechanics, the properties of system are not well-defined between measurements and "reality" depends on how and why we observe it (Bohr, 1935).

Some interpretations of quantum theory suggest that past and future both play a role in defining present. There is a metaphor "For past and future to kiss in present". Several modern approaches like causal set theory (Sorkin, 1987) and causal fermion systems (Finster, 2011), suggest that time is not fundamental element of universe but emerges from structure of cause and effect. At the cosmological level, the Hawking–Hartle no-boundary proposal (Hartle, 1983) suggests that the universe is finite yet without a temporal boundary, eliminating the need for a beginning and redefining time itself. This suggest that time is not a separate clock, but the continuous increase in the disorder and possible options in the universe. If these options stop increasing, then time will also cease to exist.

Time Beyond Measurement: A Philosophical View

The Metaphysical framework from which physics starts include notions like flow, passage, and becoming. These are features that are usually associated with time (Maudlin, 2007). The trouble is that if you try to formalize these notions so that they are fit to do jobs in a discourse that you want to be extremely clear, explicit and logical. It's hard to know how to do that. As time is strongly related to changes so we can say that each moment in time is like a new universe, because it's something completely new it gets reborn again and again.

A commonly asked question is: how fast does time flow? The usual answer is one second per second and this raises next question: what would it be like if it were flowing two seconds per second instead of one second per second? The question itself begins to lose meaning. It's not even clear what time means. Since the scientific revolution, from Galileo to Isaac Newton time has been treated as a measurable parameter. Later Albert Einstein's relativity made this description explicitly geometrical. Despite this progress we haven't been able to make a fundamental metaphysical sense of time passage.

Time in the Quran: Relativity, Measurement, and the Divine Flow

In the Quran, there is no single chapter exclusively devoted to time, but its presence permeates every verse. Quran uses verbal shifts to capture the unfolding of moments: the past tense places events in completed moments (Quran 20:25), the present reflects continuity (Quran 3:29), and specific prefixes turn verbs toward the coming future (Quran 2:142). Time in the Quran is neither abstract nor arbitrary; it is woven into the structure of creation through precise calculation (Quran 30:55). The Quran introduces the concept of **AL-Mizan** (Quran 55:7) which includes all instruments used to quantify the world, including clocks and calendars.

The text describes different temporal domains: a day with the Lord may be like a thousand years of human counting (Quran 32:5), while the ascent of angels can span fifty thousand years in a single day (Quran 70:4). This suggests that temporal intervals are domain-dependent, much like the time dilation found in Einsteinian physics.

The Quran provides a profound illustration of relative time in the story of the man who died for a hundred years and was then revived. To the man, it felt like only a day or part of a day had passed. While his food did not spoil—effectively frozen in time—his donkey had decayed into bones (Quran 2:259), showing that time can be stretched or compressed independently of physical location through divine intervention.

Conclusion

Time is not what it seems. Time is not a simple unity without parts, the ever-existing stage on which events are played. Time has various features or elements that may work together and appear seamless, but are not required to do so. What are these parts of time? Time has flow, like a river. Time has direction always proceeding forward into the future. Time has order—one thing after another. Time has duration—a measurable period between events. Time has privileged present; only now is real. Time has dimension, something like space. Whether these parts are more constructs of human brains than actual realities of the physical world. The challenge is that physics supports a block universe. A 4-dimensional structure where time is like space where every event has its own coordinate or address in space. Time so that future and past are no less-real than present. The alternative is that present is indeed, super special, and the deep nature of reality is one of the becoming. But if I ignore time, I am not closer to truth.

About the Author

Aneela Fatima is student of software engineering, actively building real skills and curious to learn patterns of universe. You can reach at aneelafatima369@gmail.com

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