What is Time

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Time is an observed phenomenon, by means of which human beings sense and record changes in the environment and in the universe. A literal definition is elusive. Time has been called an illusion, a dimension, a smooth-flowing continuum, and an expression of separation among events that occur in the same physical location.

Time is a practical convenience in modern life. Numerous standards have been set up, allowing people to coordinate events and, in general, keep their lives running smoothly. The earth has been divided into so-called time zones that reflect the fact that high noon occurs at different times at different places on the planet. All of these time zones are referenced to the time at the longitude of Greenwich, England. A universal standard, coinciding almost exactly with the time at Greenwich, is known as Coordinated Universal Time (UTC). There are various other time standards.

The fundamental unit of time in the International System of Units (SI) is the second(symbolized s or sec). One second elapses during the occurrence of exactly 9,192,631,770 (9.192631770×10^9) cycles of the radiation produced by the transition between two levels of the cesium 133 atom. Other common units of time include the hour, the mean solar day, and the synodic year (sun-based earth year). The table below shows the relationship among the second, the hour, the mean solar day, and the synodic year.

Unit (and symbol)	To convert time in given unit to time in seconds, multiply by:	To convert time in seconds to time in given unit, multiply by:
hour (hr)	3600	2.7778×10^{-4}
mean solar day (dy)	8.6400×10^4	1.1574×10^{-5}
synodic year (yr)	3.1558×10^7	3.1688×10^{-8}

Isaac Newton believed that time is continuous, and that it flows at an unchanging rate everywhere in the universe. This was accepted by most scientists until the Michelson-Morley experiment around the end of the 19th century, from which it was discovered that the speed of light is the same regardless of the direction of propagation, and regardless of the motion of the source. Albert Einstein considered this result an axiom, from which he derived the special and general theories of relativity. According to relativistic physics, the rate at which time passes depends on the relative motion between observers, and also on the strength of a gravitational or acceleration field

Newton's Views on Space, and Time

Isaac Newton founded classical mechanics on the view that *space* is distinct from body and that*time* passes uniformly without regard to whether anything happens in the world. For this reason he spoke of *absolute space* and *absolute time*, so as to distinguish these entities from the various ways by which we measure them (which he called *relative spaces* and *relative times*). From antiquity into the eighteenth century, contrary views which denied that space and time are real entities maintained that the world is necessarily a material plenum. Concerning space, they held that the idea of empty space is a conceptual impossibility. Space is nothing but an abstraction we use to compare different arrangements of the bodies constituting the plenum. Concerning time, they insisted, there can be no lapse of time without change occurring somewhere. Time is merely a measure of cycles of change within the world.

Associated with these issues about the ontological status of space and time was the question of the nature of true motion. Newton defined the true motion of a body to be its motion through absolute space. Those who, before or shortly after Newton, rejected the reality of space, did not necessarily deny that there is a fact of the matter as to the state of true motion of any given body. They thought rather that the concept of true motion could be analyzed in terms of the specifics of the relative motions or the causes thereof. The difficulty (or, as

Newton alleged, the impossibility) of so doing constituted for Newton a strong argument for the existence of absolute space.

In recent literature, Newton's theses regarding the ontology of space and time have come to be called *substantivalism* in contrast to *relationism*. It should be emphasized, though, that Newton did not regard space and time as genuine substances (as are, paradigmatically, bodies and minds), but rather as real entities with their own manner of existence as necessitated by God's existence (more specifically, his omnipresence and eternality).

Einstein'sViews on Space, and Time

In the beginning of the twentieth century, Albert Einstein revolutionized the way scientists think about space and time. "Elementary Einstein" takes you on a tour of his surprising ideas and their coolest applications.

In his special theory of relativity, Einstein showed that time and lengths are not as absolute as everyday experience would suggest: Moving clocks run slower, and moving objects are shorter. Those are just two of the unusual properties of Einstein's world! Another consequence of special relativity is the most famous formula of all: $E= mc^2$, stating that two physical quantities which physicists had defined separately, namely energy and mass, are in fact equivalent.

In Einstein's general theory of relativity, space and time become even more flexible. "Your mileage may vary," and so may the time intervals you measure, depending on where and when you are. This flexibility has an analogue in the geometry of surfaces like that of a sphere - there is a curvature of space and time. Distorted space and time influence the way that material objects or light move. In fact, there is a direct connection to the cosmic interaction that holds the universe together, makes the earth orbit the sun and keeps our feet on the ground: gravity.

Einstein's theory of space, time and gravity predicts a number of new phenomena. Distortions of the geometry of space should propagate

into the depths of space as so-called gravitational waves. If enough mass is concentrated in a given location, the perfect geometrical prison should form - a region called a black hole. No object that enters such a region can ever escape! In addition, there are the big bang models, which form the foundation of modern cosmology - the study of the universe as a whole, its structure and evolution.

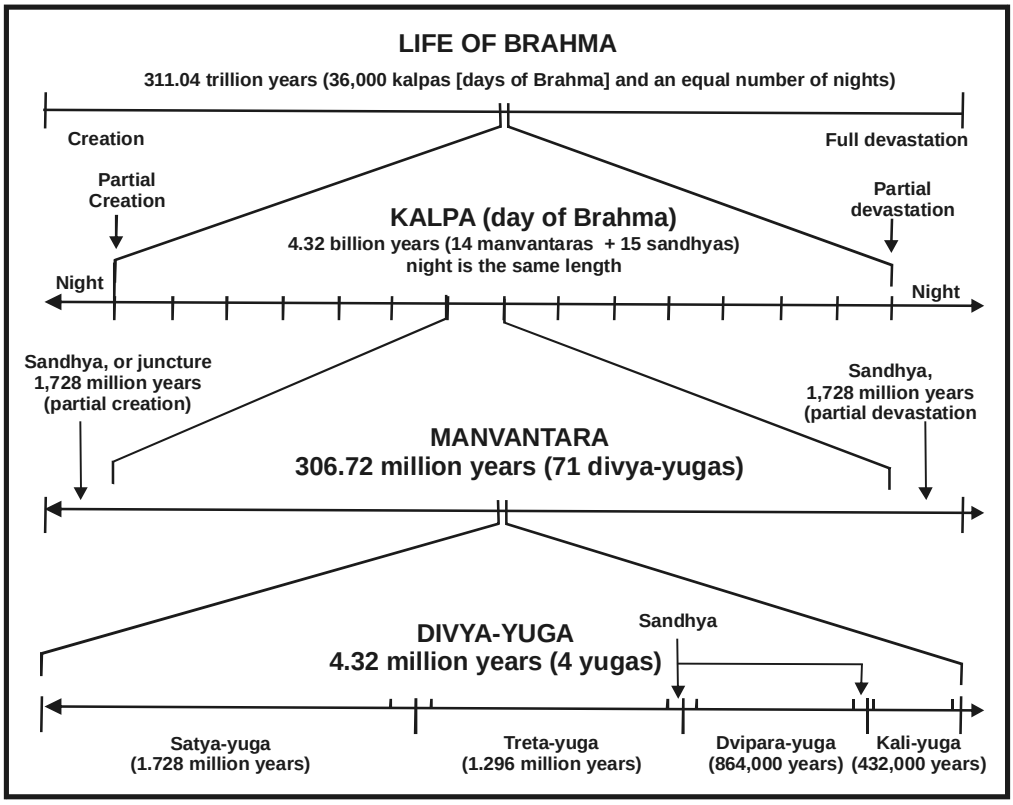
General relativity is the foundation of modern astrophysics and cosmology. But there is another physical theory at least as fundamental: quantum theory. The section on Relativity and the quantum tells you what happens when you combine quantum theory and Einstein's special relativity: the result is modern particle physics, the study of the most elementary constituents of matter. The same section takes you right to the frontiers of today's physics - more concretely, to one of its most persistent unsolved problems: There's still no complete theory of quantum gravity, i.e. no theory that unites Einstein's generalrelativity with the laws of the quantum world.

Vedantic View on Space and Time

"Hindu historical literatures, particularly the Puranas and Itihasas, place human existence in the context of repeating time cycles called yugas and kalpas, lasting hundreds of millions of years. During this entire time, according to the Puranic accounts, humans coexisted with creatures in some ways resembling the earlier toolmaking hominids of modern evolutionary accounts."

The Yuga Cycles*

"Each yuga cycle is composed of 4 yugas. The first, the Satya-yuga, lasts 4800 years of the demigods. The second, the Treta-yuga, lasts 3600 years of the demigods. The third, Dvapara-yuga, lasts 2400 years of the demigods. And the fourth, Kali-yuga, lasts 1200 years of the demigods. Since the demigod year is equivalent to 360 earth years, the lengths of the yugas in earth years are, acording to standard Vaishnava commentaries, 432,000 years for the Kali-yuga, 864,000 years for



the Dvapara-yuga, 1,296,000 years for the Treta-yuga, and 1,728,000 years for the Satya-yuga.

"This gives a total of 4,320,000 years for the entire yuga cycle. One thousand of such cycles, lasting 4,320,000 years, comprises one day of Brahma, the demigod who governs this universe. A day of Brahma is also called a kalpa. Each of Brahma's nights lasts a similar period of time. Life is only manifest on earth during the day of Brahma. With the onset of Brahma's night, the entire universe is devastated and plunged into darkness. When another day of Brahma begins, life again becomes manifest.

"Each day of Brahma is divided into 14 manvantara periods, each one lasting 71 yuga cycles. Preceding the first and following each manvantara period is a juncture (sandhya) the length of a Satya-yuga (1,728,000 years). Typically, each manvantara period ends with a partial devastation. According to Puranic accounts, we are now in

the twenty-eighth yuga cycle of the seventh manvantara period of the present day of Brahma."

"This would give the inhabited earth an age of about 2 billion years. Interestingly enough, the oldest undisputed organisms recognized by paleontologists - algae fossils like those from the Gunflint formation in Canada - are just about that old.** Altogether, 453 yuga cycles have elapsed since this day of Brahma began. Each yuga cycle involves a progression from a golden age of peace and spiritual progress to a final age of violence and spiritual degradation."

Conclusion

It's a famous quote in Book II of St. Augustine, The Confessions: "And I confess to thee, O Lord, that I am still ignorant as to what time is." And yet, may may be time does exist somewhere.

So, what I would like to put forward is that TIME is kind of like an atomic nucleus. It's not completely stable. It has a half-life. It will decay. If you look at it, it looks perfectly stable, there's nothing happening… there's nothing happening … and then, boom! Suddenly there's an alpha particle coming out of it, except the alpha particle is another universe.

We can just say that to understand time is difficult but to understand the importance of it in our life and the history of Humanity is immense. So understand the power and importance of time and chase your dreams because "TIME STOPS FOR NO ONE"

References

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