

## TIME'S CONSTANT

*Time* is the *rate* of change of an event. *Space* is the *extent* of the change, and is equal to the quantity of substance which it encompasses.

A space-time *event* refers to the *combined* rate and extent of the incremental changes which constitute the event.

A planet, star, or galaxy moves through space at a specific velocity and for a specified duration and distance, depending on the mass and density of the body, the medium of travel, and the forces which act upon it.

In general, space-time is a continuum in which there is no spatial volume or time interval that is void of substance or activity, only a more or less coherent interaction of events occurring at various orders of magnitude and scale and at different velocities and durations.

All objects and events are constituents of space, and evolve at time durations and velocities which correspond to their changing states.

Space-time events are influenced by other events in varying degrees. The more an event is influenced by another event, the less the degree of difference in space and time between the events.

Space-time *relations* are the absolute or observed intervals which occur between the beginnings and endings of events, or which separate events, in space and time.

*Observation* is the ability to distinguish change within a range of greatest and least occurrence of mass, energy, and lifespan.

The observation of events is affected by the relative motions of the observer and the observed.

Relative values for space-time intervals are determined by the observer's fixed or moving position in relation to the position of the events which are being observed.

Variations in the observation of space-time intervals tend to alter the observer's awareness of them.

Although distances and times vary for different observers, they form an absolute space-time interval for all observers.

Both the process of observing events and the events themselves have absolute time values.

The observation of events is a result of the function of sensory organs which detect physical events in the outside world, and of the nervous system which transmits sensory information to the brain where it is recorded and processed in various ways.

The rates of reception and transmission in the nervous system produce a time lag which prevents the brain from processing information instantaneously.

The time required to make an observation depends upon the combined rates of reception and transmission in the nervous system, along with the feedback rates governing the processes of the brain.

By processing information which has been recorded in memory, the brain is able to observe the continuity of present events, recognize past events, and predict future events. Future events are predicted by analyzing recurring patterns of information, and forming judgments based on the causal relations which determine those patterns.

The ability to *remember* or *predict* events is due both to the causal direction of events in time, and the functions of the brain which process the events.

Two or more events which occur at the same time are *simultaneous*.

Events which are simultaneous occur at nearly the same time, but do not necessarily begin or end at the same time or have equal time values.

Although the consequences of changing events may be observed over time, such as the gradual buildup of a mountain chain or the lifecycle of a star, the combined action of all events occurring in the universe at any given moment is nearly *instantaneous*.

*All events occur simultaneously in the present.*

The instantaneous moment of time in which all events occur is equal to the minimum length of time required to cause a change.\*

The average time rate at which all events occur is equal to the sum of the rates divided by the number of events.

The instantaneous moment of time in which all events occur, and the average rate of the events are *constant*.

\* In quantum physics, the minimum amount of time which is meaningful is equal to the unit of time known as the Plank time, or  $10^{-43}$  sec. The Plank time is calculated by combining the fundamental constants of gravity, the average speed of light, and Plank's constant. The Plank time is given by the square root of  $Gh/c^5$ .