

SECTION 4

The Universal Decay Redshifts

THE PROPAGATION OF MEDIUM

The *Propagated Outward Flow of medium*, which flow carries and travels like light, is controlled by the pair of parameters μ and ε . The situation is the same as that of propagation of electrical signals along a transmission line.

A transmission line is an electrical device for transmitting oscillatory electrical signals from one place to another. Examples are: the various coaxial cables and two-wire pairs found in radio, and video systems interconnecting equipment components. When electrical signals are introduced at one end of such a line they do not appear at the far end instantaneously. Rather, there is a finite speed of travel of the electrical effects along the line.

The reason is that any such line inevitably has some series electrical inductance and shunt capacitance whether intentionally placed there or not. These are distributed along the length of the transmission line in minute increments. The speed of travel of the electrical signal along the line is limited by the time that it takes the signal to build up its full value successively through the electrical inductance of each minute increment and the time that it takes to build up its full value successively on the capacitance of each minute increment.

The electrical inductance of a coil of wire is μ_0 times the dimensions of the coil, $N \cdot A / L$, where N is the number of turns in the coil, A is the cross-sectional area of the coil and L is the length of the coil. The N is a dimensionless number. Thus the inductance is, dimensionally, μ_0 times an area divided by a length, that is times a net length. The μ_0 is then inductance-per-length.

The electrical capacitance of a simple parallel plate capacitor is ε_0 times the dimensions of the capacitor, A / L , where A is the area of each of the two identical plates and L is the distance between them. Thus the capacitance is, dimensionally, ε_0 times an area divided by a length, that is times a net length. The ε_0 is then capacitance-per length.

THE UNIVERSAL EXPONENTIAL DECAY REDSHIFT

The Big Bang took place in absolute nothing. Before the Big Bang there was only absolute nothingness. There was no “free space” with μ_0 and ϵ_0 . After the Big Bang’s explosion into all of the particles of the universe, each of those particles was sending its own *Propagated Outward Flow* into nothing, into emptiness.

Where did the oscillatory *Propagated Outward Flow*’s μ_0 and ϵ_0 come from? The only thing they could have come from was the *Propagated Outward Flow* itself, that is from each particle’s *core* medium content. There is no other possible source because everything else was absolute nothing, “the zero of existence”. The μ_0 and ϵ_0 are inherent in the substance of the oscillation, the *medium*, which means, μ_0 and ϵ_0 are also inherent in the outward propagation. Each particle’s *Propagated Outward Flow* contains, carries within it, has its speed of propagation determined by and set at its value at the moment it was emitted, by its own μ_0 and ϵ_0 .

In the propagating medium its μ_0 parameter is its inductance and its ϵ_0 parameter is its capacitance. Their effect in determining the speed of propagation is the same as in a transmission line, above. The dimensions of each include the factor $1/Length$. As all length aspects decay so do μ_0 and ϵ_0 consequently “anti-decay”. That conforms to their role in the denominator in the speed of light equation (4-1), c decaying in its L/T dimension.

$$(4-1) \quad c = \frac{1}{\sqrt{\mu \cdot \epsilon}}$$

The exponential decay of the medium content of each particle *core* by the *Propagated Outward Flow* of *medium* means that because of the gradual augmentation of the μ_0 and ϵ_0 the speed of light, c , is itself decaying, equation (4-2).

$$(4-2) \quad c(t) = c_{[t=0]} \cdot \epsilon^{-t/\tau}$$

The universal decay redshift occurs because we observe ancient light traveling at the speed at which it was originally emitted, a speed significantly larger than our present local speed of light because at the earlier time it was emitted it was less decayed. We observe the greater speed as longer wavelengths in the light. The formulation for the universal decay redshift, z_τ , of light that was emitted at time $t = T$ after the "Big Bang" and is observed at time $t = now = age\ of\ the\ Universe$ is as follows.

$$(4-3) \quad \begin{aligned} z_\tau &= \frac{\lambda_T - \lambda_a}{\lambda_a} \quad T = \text{time since Big Bang that light observed was emitted} \\ &= \frac{c(T) - c(a)}{c(a)} \quad a = \text{age of Universe} = \text{time now since Big Bang} \\ &= \frac{c_{[t=0]} \cdot \epsilon^{-T/\tau} - c_{[t=0]} \cdot \epsilon^{-a/\tau}}{c_{[t=0]} \cdot \epsilon^{-a/\tau}} \\ &= \frac{\epsilon^{-T/\tau}}{\epsilon^{-a/\tau}} - 1 \end{aligned}$$

A number of years ago, in the late 20th Century, the estimates of astronomers and astrophysicists were that the earliest galaxies took about 2½ - 3 billion years to form, that is, that they did not appear until *2.5-3.0 billion years* after the Big Bang. Those estimates were based on analysis of the processes involved in star formation and in the aggregation and “clumping” of matter in the early universe.

Since then improved equipment and techniques [e.g. Keck and Hubble telescopes and gravitational lensing] have resulted in reports of observation of early galaxies having stars that formed as early as *300 million years* after the Big Bang according to the Hubble Law. Such a major reduction of earlier estimates to such a brief time and so soon after the Big Bang would appear to be questionable, but it is a result of the Hubble Law.

The Universal Exponential Decay completely resolves the problem of sufficient time after the Big Bang for the earliest stars to form. No matter how high the observed *z* may be the beginning of the exponential decay preceded it by the required star formation time. We may never know how long ago the Big Bang happened and we may never know the requisite time for the earliest stars to form, but we can know how long ago the oldest stars observed formed and we can know that the Big Bang took place a while before then.

Figure 4-1 below is a plot of the Universal Decay with the age of the Universe estimated to be *a = 30 gyrs*. That value is chosen to account for redshifts greater than *z = 11* having been observed and to allow for the possibility of still larger redshifts being observed.

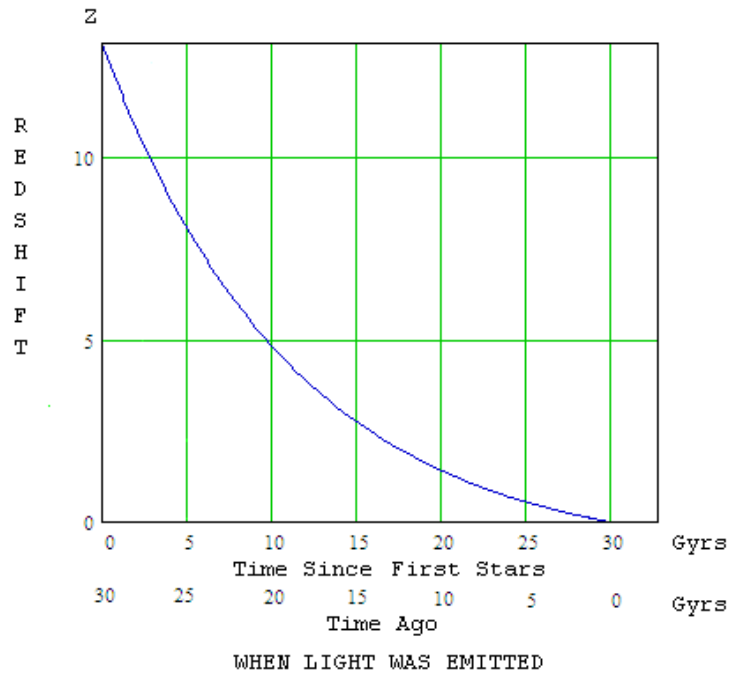


Figure 4-1
The Universal Exponential Decay

COMPARISON – HUBBLE VS. THE UNIVERSAL DECAY

Figure 4-2, below compares the Hubble Law, Figure 1-3 and the Universal Exponential Decay Figure 4-1 above.

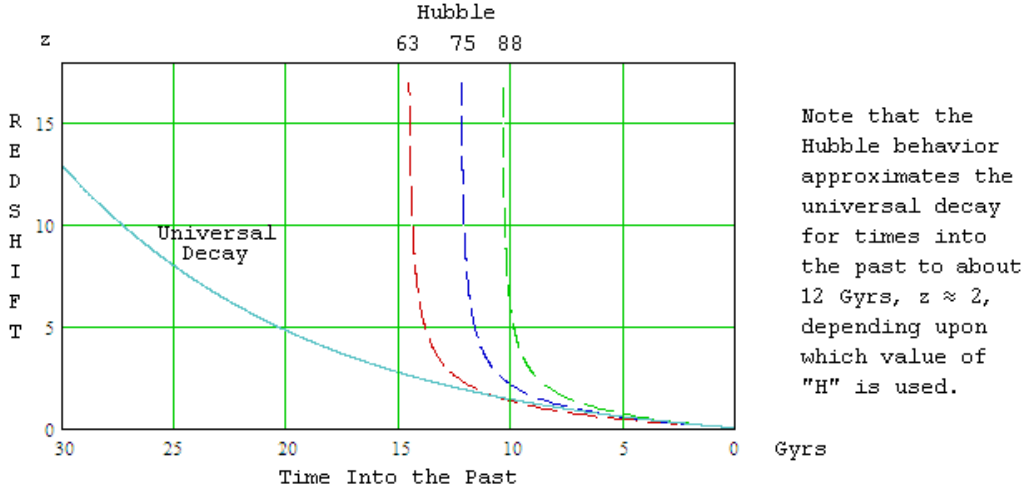


Figure 4-2
 Comparison: Hubble Law vs. Universal Exponential Decay

The above figure makes clear the reason for current cosmology estimates of the age of the universe being *13.8 Gyrs*; it is the asymptotic behavior of the relativistic Hubble redshift formulation. Unfortunately, the currently more favored value for the Hubble "Constant", $H_0 = 73$ fails to correspond well to the currently favored age of the universe of *13.8 Gyrs*.

The astral objects that we observe do exhibit a redshift caused by the Doppler Effect; however that is a minor part of the total redshift. The actual velocities involved are less than the speed of light. The primary cause of the observed redshifts is the Universal Exponential decay.

The next Part III presents four independent phenomena which

Evidence the Universal Exponential Decay:

Evidence Its Anomalous Acceleration a_A .