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The Cosmology Underlying the Hubble Equality

Hubble's law, states that recession speed, v_R , is equal to a new speed, $H_0 D$, where H_0 is Hubble's constant and D is the distance to the inter-galactic photon source.

The "Hubble Equality" is $v_R = H_0 D$.

The relativistic Doppler Effect is used to relate the intergalactic photon red-shift to recession speed.

When the relativistic Doppler equation is solved for β , (v_R / c), it is well-known that

$(v_R / c) \rightarrow 1$, when the red-shifted wavelength, λ , $\rightarrow \infty$. Using the Hubble Equality, one obtains $(H_0 D / c) \rightarrow 1$. Therefore, in the limit,

$D = (c/H_0) \equiv R_0 = 13.4$ billion light-years.

R_0 is the radial limit of our observable universe.

Photons emitted from beyond this distance can never reach us. What is beyond is unknowable by electromagnetic means.

R_0 is defined by two fundamental, time-independent constants. There is no expansion.

Moreover, "the universe" is now a relative idea.

An observer 10 billion light years from us would be bound by this same R_0 limit, so their "observable" universe would be different from ours.

Thus, according to the Hubble Equality, our observable universe is not expanding. However, our universe is limited in space, but not in time.

QED

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