

## Hubble's Law on expanding universe debunked?

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*Cosmic dust is shown to redshift light from distant galaxies instead of by an expanding universe claimed in the Hubble Law*

In the 1920s, Edwin Hubble discovered a relationship that we now know as Hubble's Law. It states the velocity of a receding galaxy is proportional to its distance to the earth. This means that a galaxy moving away from us twice as fast as another galaxy is twice as far away.

Hubble based his law on inferring the velocity of a galaxy by the Doppler effect whereby the wavelength of light from the galaxy is redshift or increased if the galaxy is moving away from us. Conversely, the wavelength of light is blueshift or decreased if the galaxy is moving toward us. Thus, by measuring the redshift of known spectral lines, Hubble claimed to estimate the recessional velocity of the galaxies.

Many astronomers then and now take Hubble's Law as proof the universe is expanding. In contrast, Einstein thought the universe was not expanding, but static.

### ALTERNATIVE THEORIES

However, there have been many theories to explain the redshift of light from distant galaxies without the Doppler theory that do not require the galaxies to be receding. One such explanation is "tired light" is redshift because a photon from a galaxy that interacts with cosmic dust reaches us with less energy than which it started. Dust is known to permeate space making this assumption very tenable. But this requires the photon to be deflected so that the image of the galaxy becomes fuzzy. However, there is no evidence for this because the images of the galaxies with redshift appear clear as those with small redshift.

Most alternative theories to redshift by the Doppler effect are usually based on hard to accept physics such as a decreasing mass of the electron and intense gravitational fields. "Tired light" from the interaction of cosmic dust is a far more credible mechanism provided the objection of fuzziness in the image caused deflections of the photon can be removed.

### PROPOSED THEORY

The theory proposed here is cosmic dust induces redshift of galaxy light by quantum electrodynamics (QED). QED induced redshift finds basis in the absorption of light by small particles (Mie 1908) where the particle is far smaller than the wavelength of incident light. Indeed, most of the incident light on a particle in space is scattered with only a tiny fraction absorbed. Of the light absorbed, the conservation of energy may take one of 2 paths. The particle may increase in temperature, but this is not possible because the specific heat of small particles already very low at 2.7 K vanishes at their EM confinement frequencies. This leaves the only conservation path to be the emission of the absorbed light as EM radiation at the EM confinement frequency of the particle.

The QED frequency  $f$  of light emitted from the cosmic dust particles depends on their diameter  $D$ , by the relation  $f = c / 2D$ , where  $c$  is the speed of light. The QED wavelength of emitted light is  $2D$ . The size distribution of dust varies throughout space, but is generally submicron. What this means is the galaxy light is not always redshift in larger particles, but sometimes blueshift as the photon is absorbed by smaller particles. The redshift light we finally see on earth is the net effect of an uncountable number of blue and

redshifts with submicron dust particles having diameters  $D$  of about 0.3 to 0.5 microns.

## CONCLUSIONS

An expanding universe based on the Hubble Law for redshift of galaxy light by the Doppler effect is unlikely. Einstein's static universe is more likely.

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