Redshift in Cosmic Dust precludes Universe Expansion and Dark Matter

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Abstract: Over the past century, Hubble's redshift of light from galaxies has intrigued scientists to ponder the current expansion rate of the Universe. Recently, a young schoolgirl published an article on the expansion of the Universe that illustrates how the misinterpretation of redshift of galaxies has falsely led astronomers over a century are being passed on to future generations. Indeed, the redshift of galaxies thought to support Hubbell's expansion of the Universe is nothing more than the redshift of a spectral line emitted from a galaxy upon interacting with nanoscopic cosmic dust. What this suggests is the Universe is not and never was expanding, nor does dark matter exist. Analysis is presented for the redshift of Balmer-lines over a range of silicate dust nanoparticle (NP) diameters. The interaction of the spectral line (SL) photon with the NP is by the simple QED method of nanoscale heat transfer that based on the Planck law denies the atoms in the NP the heat capacity to conserve the absorbed SL photon by an increase in temperature. In this regard, the NP diameter is required to be smaller than the SL photon wavelength which spontaneously immerses the NP in SL radiation. But the SL radiation cannot penetrate the NP surface as NP temperatures do not exist for Fourier conduction. Conservation may only proceed by creating temperature independent EM waves, the Planck constant divided by the time for the EM wave to travel across and back the NP diameter defining the Planck energy of the simple QED photon standing across the NP diameter. EM confinement of SL photon energy within the NP is provided by the inwardly disposed momentum of the SL radiation itself. Redshift in cosmic dust occurs when the wavelength of the simple QED photon is greater than that of the incident SL photon, and may accumulate in many successive NP interactions before reaching the observer on Earth.

Keywords: Expanding Universe, cosmic dust, redshift, Hubbell, Planck law, nanoparticles, simple QED

I. INTRODUCTION

Hubble's discovery [1] of an expanding Universe inferred from redshift measurements of spectral line emissions from distant galaxies has misdirected astronomy for the past century. Many scientists have devoted their lifetime work to the folly of an expanding Universe based on redshift measurements, a folly that is being passed on to future scientists.

Guided by her superiors, a young high school girl recently published [2] an article on calculating the expansion rate of the Universe. The work is representative of that published by senior scientists in astronomy. Nevertheless, the falsity of redshift as a basis for Universe expansion which is and has been a problem for astronomy remains. The velocity of Universe expansion in terms of redshift z is illustrated in Fig. 1.

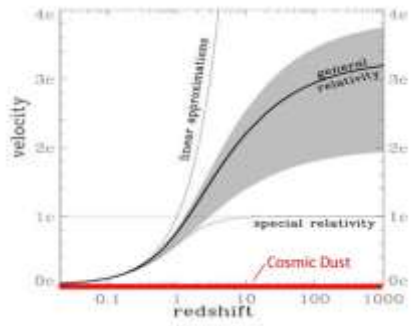

Figure 1. Universe expansion velocity and redshift

II. PURPOSE

The purpose of this paper is to propose the redshift measured by Hubble and others over the past century is caused by cosmic dust having nothing to do with Universe expansion including dark matter. Indeed, cosmic dust precludes Universe expansion suggesting a static and infinite Universe once proposed by Einstein noted by the red line coincident with zero velocity in Fig. 1.

III. THEORY

The simple QED theory of nanoscale heat transfer provides [3] the basis for redshift in cosmic dust. Based on the Planck law, heat from SL photons absorbed by cosmic dust NPs is not conserved by an increase in temperature, but rather by creating redshifted EM radiation in the NP.

A. Planck law

The Planck law [4] of quantum mechanics (QM) denies atoms in NPs the heat capacity to increase in temperature upon absorbing heat. The average Planck energy E of the atom is,

$$E = \frac{\frac{hc}{\lambda}}{\left[\exp\left(\frac{hc}{\lambda kT}\right) - 1\right]} \qquad (1)$$

and at 300 K is plotted in relation to classical physics in Fig. 2.

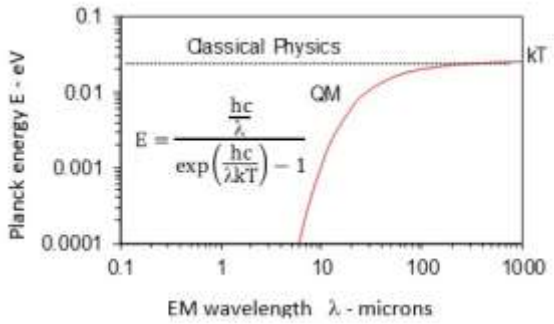

Figure. 2: Planck law of QM at 300 K
In the inset, E is Planck energy, h Planck's constant, c light speed, k Boltzmann's constant, T temperature, and λ the EM wavelength.

The Planck law at 300 K shows classical physics allows the atom to have constant thermal kT heat capacity over all EM wavelengths λ. QM differs as the kT heat capacity decreases for λ < 200 μm, and vanishes at the nanoscale for λ < 200 nm.

B. Simple QED

Simple QED is the consequence of the Planck law denying atoms in NPs the heat capacity to increase in temperature upon the absorption of heat. QED stands for quantum electrodynamics, a complex theory based on *virtual* photons advanced by Feynman [5] and others. Simple QED is far simpler only requiring the heat capacity of the atoms in NPs to vanish allowing conservation to proceed by the creation of *real* photons comprising EM waves that stand across the NP as shown in Fig. 3.

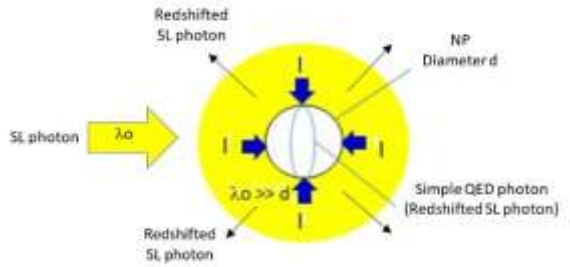

Figure 3. Simple QED redshifted SL photon

Fig. 3 depicts a SL photon having wavelength λo interacting with a NP of diameter d. For NPs having d < λo, the NP is instantly immersed in SL radiation. Inward disposed Poynting vector S ~ W/m^2 (yellow) carry SL momentum I (blue arrows) applying pressure to the NP surface to confine the EM energy of the absorbed SL photon to the shape of the redshifted simple QED photon.

Similar to atomic quantum states described by electrons in discrete orbitals, simple QED states are dependent on the diameter of the NP over which the EM waves stand. However, the simple QED photons can only be created by QM as classical physics requires very high temperatures to create photons.

By QM, the Planck law denies NPs the temperatures required for Fourier heat conduction and the heat flux Q cannot penetrate the NP surface. Conservation of Q may only proceed by non-thermal EM waves carrying the heat Q across and back the NP diameter d in time τ = 2d/(c/n), where n is the index of refraction of the NP. At this instant, the simple QED photon is created having Planck energy E = h/τ and wavelength λ = 2nd,

$$E = \frac{hc}{2nd} \qquad (2)$$

Importantly, the simple QED photon must be placed under brief EM confinement to produce the standing wave that fits the NP diameter. The EM confinement is not produced by some structuring of the NP surface, but rather by the momentum I of the heat Q flux itself. In effect, the momentum I briefly holds the absorbed SL photon energy until it forms a standing EM wave that fits the NP diameter d which defines the wavelength of the redshifted SL photon.

But the standing EM wave is stationary and cannot carry the redshifted SL photon into the surroundings. Energy Wave Theory (EWT) is invoked that requires [6] transverse EM waves accompany standing waves at the instant of formation thereby allowing transverse waves of redshifted SL photons to freely propagate into the surroundings.

Energy E is conserved between standing and transverse photon states, i.e., E = mc^2 and hc/2nd, respectively. Here, m is the standing photon mass. But photon momentum I = mV = h/2nd. Hence, V = c, i.e., the redshifted SL photon moves into the ISM at the speed of light.

IV. ANALYSIS and DISCUSSION

Since the 1970's, dark matter was thought [7] to exist because the rotational velocities found in Andromeda M31 and other low-redshift galaxies (z < 0.001) were higher than expected by Newtonian mechanics which suggested the galaxies could not be held together as they appear. Following Hubble, the M31 rotation velocities were inferred from the redshift of the 658.3 nm nitrogen NII line, the consequence of which was flat rotation curves became the signature of dark matter holding galaxies together. The NII line is almost coincident with Hα.

However, high-redshift (0.6 < z < 2.6) galaxies in the distant Universe were recently [8] found to have falling rotation curves suggesting the absence of dark matter, at least at the galaxy periphery. Similarly, the recently discovered transparent Ghost galaxy was found [9] to have a falling rotation curve suggesting dark matter is not present absent cosmic dust.

Historically, galaxy redshift in cosmic dust went unnoticed for almost a century because the light-matter interaction of galaxy light including NII was assumed to follow classical physics allowing the heat capacity of the nanoscopic dust particle to conserve the galaxy

photon by an increase in temperature. But the heat capacity of the atom given by the Planck law of QM is not scale invariant being finite at the macroscale while vanishing at the nanoscale. Conservation of the galaxy photon is therefore only possible by a non-thermal mechanism proposed here to be simple QED and has been proposed [10] as alternative to Hubble redshift on numerous occasions.

Other alternatives to Hubble redshift have been proposed, one of which [11] is based on recently discovered large quantities of H_2 gas which is transparent and also may explain the missing mass in dark matter. Since light-molecule interactions are inelastic, the light is redshifted as very small amounts of energy are loss with each collision. But light from a galaxy would need to make many H_2 collisions to accumulate to high Hubble redshift levels.

In contrast, simple QED induced redshift in cosmic dust requires galaxies create SL photons of ionized H atoms by high temperatures or UV radiation, although SL of any element like NII used in M31 may be used. Unlike H_2, the interaction of SL of H interaction with a NP of cosmic dust may produce a high redshift in a single collision.

The Balmer series of H is important in astronomy as most of the Universe consists of the element hydrogen. Hydrogen is present almost everywhere and SLs of H are visible in most galaxy spectra. The cosmic dust redshift z for the Balmer series in relation to the dust diameter d is given in Fig. 4.

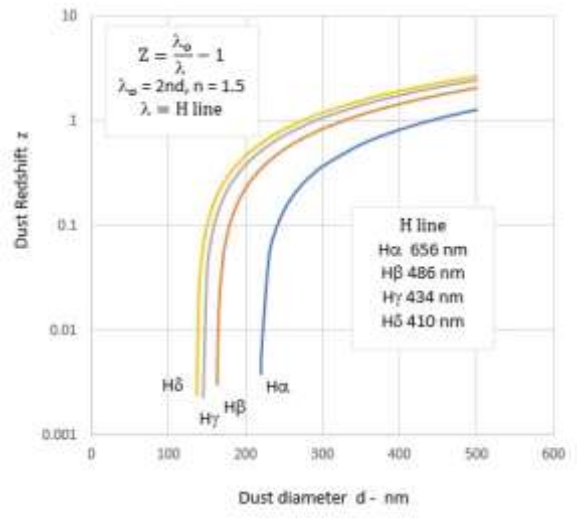

Figure 4. Balmer series - Cosmic redshift v. dust diameter

Fig. 4 shows high Hubble redshift (z~1) galaxies [12] are produced in 300-400 nm cosmic dust particles by a single interaction of a Hα line photon compared to a very large number H_2 collisions.

Of importance, cosmic dust redshift overstates velocities giving the impression dark matter is present to hold the galaxy together, i.e., cosmic dust is in effect creating dark matter which in reality does not exist.

Similarly, the overstated Hubble redshift of M31 by cosmic dust suggesting dark matter was present to keep the galaxy from flying apart, the higher rotational velocities at the periphery became known as the signature of dark matter having flat rotation curves rather than the falling curves of Newtonian mechanics.

Recently, the transparent Ghost galaxy having high redshift ($0.6 < z < 2.6$) and a falling rotation curve simply suggests cosmic dust is concentrated at the galaxy center and not at the periphery.

V. CONCLUSIONS

For a century, Astronomy has been misdirected by cosmic dust to false notions of an expanding Universe and dark matter neither of which exist and can never be verified experimentally. Sadly, young scientists are nevertheless being guided to continue these false notions of Astronomy into the next century.

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