

**Dark Matter only Exists because of Cosmic Dust**

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**Abstract:** Dark matter in cosmology requires the existence of a mass about 5 times that on Earth, but is invisible and cannot be observed. Because of the unusual nature of dark matter, it is only natural to question whether dark matter even exists. Nevertheless, astronomers do admit there are still fundamental gaps in our understanding of cosmology and that currently accepted paradigms such as dark matter are incomplete and perhaps even incorrect descriptions of the Universe. In this regard, a review of how dark matter was thought to exist showed cosmic dust increased the redshift of galaxy light and therefore galaxy velocities were highly overstated. Indeed, Newtonian mechanics showed the galaxy clusters should fly apart contrary to what was observed. Astronomers therefore believed dark matter existed to hold the galaxy clusters together.

But the problem with galaxy velocities and redshift is not new. Hubble found it difficult to believe galaxy velocities were real and instead found it easier to suppose that the lines of the spectra are shifted to the red by some property of space acting on the light during its journey to the Earth. Following Hubble, this paper proposes galaxy velocities are not real and cosmic dust that permeates the Universe is the property of space that redshifts spectra lines. Later, Arp proposed the redshifts were intrinsic giving the false impression dark matter is present, when in fact it does not exist, perhaps explaining why the search for dark matter particles to date has not succeeded.

Based on classical physics, astronomers claim the light from distant galaxies upon absorption in cosmic dust simply raises its temperature to explain the IR spectra in the ISM. But the dust is nanoscopic and governed by QM, the Planck law of which shows cosmic dust cannot conserve galaxy light by raising temperature because its heat capacity vanishes. QM stands for quantum mechanics. Nevertheless, the absorption of galaxy light of wavelength  $\lambda_0$  must be conserved. In this regard, conservation proceeds by simple QED creating a non-thermal photon of wavelength  $\lambda$  standing across the diameter of the cosmic dust. Because of the high surface-to-volume of nanoscopic dust, the galaxy photon is effectively absorbed in the surface of the dust thereby providing the EM confinement for the absorbed energy of the galaxy photon. In effect, a photon is created having a half-wavelength  $\lambda/2$  fitting inside the diameter  $d$  of the dust nanoparticle. Depending on the refractive index  $n$  of the dust, the Planck energy  $E$  of the simple QED state is,  $E = hc/2nd$ . If  $\lambda = 2nd > \lambda_0$ , a redshifted galaxy photon is re-emitted, as  $2nd < \lambda_0$  violates energy conservation. Of importance, cosmic dust redshift has been verified in numerous Earth based experiments showing redshift of laser light by nanoparticles. Historical observations in astronomy are discussed including the resolution of the long-standing galaxy rotation problem without the need for dark matter if the higher than expected galaxy velocities are corrected for the redshift in cosmic dust. Similarly, an accelerating Universe expansion need not exist if the observation showing supernovae brighter than expected is corrected for the redshift in dust.