

Dust and the Origin of the Universe

Dust may be an annoyance in our everyday view of what we see on Earth, but cosmic dust that permeates interstellar space may be important in our understanding of the origin of the Universe. In 1926, Hubble's redshift measurements of light from distant galaxies changed the long-standing paradigm of a static and infinite Universe governed by Newtonian mechanics to a finite and expanding Universe following Einstein's general relativity, or GR. In the 1970's, Vera Rubin's redshift measurements of galaxy rotation curves showed a flat velocity profile in contrast to decreasing velocities predicted by Kepler's law, the high velocities suggesting dark matter had to be present to hold the galaxies together. Recently, GR was proposed [1] modified by scale invariance allowing high rotational velocities without the need for dark matter to hold the galaxies together. But scale invariant GR requires the large scale Universe to be empty space without mass which certainly is not self-evident, and in fact can only be erroneous because of cosmic dust.

In this regard, an alternative theory of the Universe is proposed : An expanding Universe and dark matter do not exist [2] if the respective recession and rotational velocities of galaxies are corrected for the redshift in galaxy light upon interaction with cosmic dust on its way to the Earth.

Historically, the redshift in cosmic dust went unnoticed for almost a century because galaxy light was assumed to follow classical physics by conserving the galaxy photon by an increase in temperature. But the heat capacity of the atom given by the Planck law of QM, although finite at the macroscale vanishes at the nanoscale, QM standing for quantum mechanics. Conservation of the galaxy photon in dust is therefore only possible by a non-thermal mechanism proposed here to be simple QED, but is far simpler than that proposed by Feynman and others.

Simple QED relies on the high S/V ratio at the nanoscale where the galaxy photon of wavelength λ_0 is absorbed almost entirely in the dust surface placing internal atoms under the high EM confinement necessary for the heat capacity to vanish by the Planck law. S/V stands for surface to volume. A non-thermal standing photon having half-wavelength $\lambda/2 = d$ is then created as the galaxy photon energy adjusts to the EM confinement bounded by the dust surface. The speed of light c corrected for the refractive index n of the dust gives the energy E of the redshift photon, $E = h(c/n)/\lambda$ for a wavelength $2nd$ and redshift $Z = (2nd - \lambda_0)/\lambda_0$. Once the energy of the galaxy photon absorbed in the dust surface is expended to form the standing photon, the EM confinement vanishes and the galaxy photon now redshifted is free to travel to the Earth.

In cosmic dust, the redshift Z for Lyman - alpha galaxy photons is shown to approach the speed of light to significantly overstate recession and rotation velocities. However, by correcting galaxy redshifts for cosmic dust, not only does dark matter not exist, but both GR and scale invariant GR are irrelevant as galaxy dynamics follows Newtonian mechanics inherent in a static and infinite Universe .

References

[1] Maeder A. (2017). Astrophysical Journal 834 194.

[2] Prevenslik T. (2010-2018). Nanoscale applications of simple QED, www.nanoged.org