

Hubble redshift by cosmic dust

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Purpose

The Hubble redshift of light from a distant galaxy is caused by cosmic dust and not by an expanding Universe commonly thought to begin with the Big Bang.

Description

In 1929, Edwin Hubble using the Doppler Effect estimated the velocity at which the galaxies are receding based on the redshift of known spectral lines in galaxy light. However, competing theories have been proposed that Hubble redshift is not caused by galaxy recession but rather by the interaction of galaxy light with dust particles (DPs) in the interstellar medium (ISM). The DP theories may be characterized as “tired light” where the galaxy photon loses energy upon being deflected by DPs, the loss of energy treated as a lower frequency photon, or by the redshift of galaxy photons. However, “tired light” theories are usually dismissed because deflections of galaxy photons should produce a fuzzy optical image, but images of the galaxies are always clear and never fuzzy.

Hubble redshift by DPs without fuzziness may be explained by the manner in which DPs conserve the absorbed galaxy light. Classically, the absorption of light in DPs is conserved by an increase in temperature, but this is only valid for micron or larger sized DPs. For submicron DPs, quantum mechanics (QM) restricts the specific heat of DP atoms to vanishing small levels, and therefore the absorbed galaxy photon cannot be conserved by an increase in temperature. Rather, conservation proceeds by the quantum electrodynamics (QED) induced frequency down-conversion of the absorbed galaxy photons to the electromagnetic (EM) confinement frequency of the DP. By this theory, QED induced redshift occurs without fuzzy images because the DPs only lower the frequency of galaxy light while its direction is unchanged.

Problem

In the ISM, the absorption of galaxy light in DPs cannot be denied, and therefore QED induced redshift unequivocally places in question the Hubble redshift as the basis for an expanding Universe. QED induced redshift depends on DP geometry. For spheres, the EM confinement wavelength L_0 is, $L_0 = 2Dn$, where D is the diameter and n is the refractive index. If galaxy light having wavelength $L = 0.7$ microns is absorbed in a DP having diameter $D = 0.2$ microns and $n = 2$, the wavelength $L_0 = 0.8$ microns and the QED induced redshift $Z = (L_0 - L)/L = 0.142$. In terms of the speed of light c , Hubble theory based on the Doppler Effect states the Universe is expanding at velocity $V = c [(Z + 1)^2 - 1] / [(Z + 1)^2 + 1] = 0.132 c$. But this is erroneous - QED induced redshift Z is caused by DP absorption!!!

Benefit

Religious beliefs in part have prompted Mankind's interest in the origin of the Universe. Theists believe God created the Universe; whereas, Atheists believe the Universe was created by itself in a random process. Both beliefs are supported by the spontaneity of the Big Bang.

However, the Universe may be eternal and always existed. The eternal Universe is consistent with Einstein's static or a non-expanding Universe in dynamic equilibrium. However,

Hubble's redshift finding negated Einstein's Universe. When confronted with Hubble's findings, Einstein admitted the static Universe was his biggest blunder. In retrospect, Einstein should have questioned Hubble's findings, but did not.

If DPs produce the Hubble redshift without the Universe expanding, Einstein's Universe may once again regain the prominence it had before Hubble's findings. If so, Atheists may claim the eternal Universe was always there, while Theist may claim God created the eternal Universe.

Experiment

The crucial step in getting QED induced redshift off the ground is to show submicron DPs in the ISM upon the absorption of galaxy light emit EM radiation instead of increasing in temperature. Experiments are proposed using laser light focused on submicron DPs.

However, laser experiments to verify QED induced redshift are not trivial and require special procedures for submicron DPs floating in a vacuum. Initially, exploratory tests with DPs at ambient temperature are planned, but may have to be extended to cooling at 3 K to simulate the vanishing specific heat in the ISM. For $n < 2$, visible light would be redshift to near infrared (NIR) wavelengths $\lambda_0 < 4$ microns. Special NIR spectrophotometers may need to be developed.

Expected Outcome

The optimal outcome is that experiments show the DPs emit redshift EM radiation upon the absorption of laser light thereby holding in question Hubble's finding. It is important to note that QED induced redshift does not prove the Universe is not expanding. Rather, an expanding Universe in Big Bang cosmology cannot be verified by Hubble redshift.

If confirmed, QED induced redshift in DPs would cause a paradigm shift in astronomy away from that which began with Hubble's finding in 1929. In a return to Einstein's Universe, there would be no need for dark matter and energy. Instead of the ISM spectrum currently thought produced by the thermal emission from submicron DPs heated by interstellar light, the ISM spectrum would be produced directly from interstellar light by QED induced redshift.

Implementation

Since Big Bang cosmology is generally accepted by astronomers, the QED induced redshift experiments require unbiased objectivity. In this regard, Professor A. Witt of the University of Toledo, Department of Physics and Astronomy is recommended to direct the proposed experiments.