Einstein's Universe and Cosmic Dust

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Abstract Cosmic dust particles (DPs) may resolve the controversy of whether the Universe follows the expansion in the Big Bang (BB) or that of dynamic equilibrium without expansion according to Einstein. Either Universe is required to be consistent with the Cosmic Background Explorer (COBE) finding that the Cosmic Background Radiation (CBR) follows the thermal emission from a blackbody at 2.726 K. Consistency of the BB with COBE relies on the claim the CBR is the thermal remnant of the fireball assumed to occur about 14 billion years ago. Even though the BB claim is unverifiable, the fact remains that COBE showed the CBR temperature with great precision to be uniform everywhere, although not smooth over the whole sky consistent with the fluctuations that give rise to the structures in present-day galaxies. Einstein's Universe must do the same. In this regard, it has been known for some time the cyanogen (CN) molecule having a rotational emission at 2.64 mm corresponds almost precisely to the CBR temperature found in COBE. Until now, only the CBR produced by the BB was thought to excite the CN. In Einstein's Universe, the CBR is simply CN emission excited by microwaves produced in DPs. The DPs are treated as Planck oscillators absent specific heat that cannot conserve absorbed starlight by an increase in temperature. Conservation of absorbed starlight proceeds by frequency down-conversion to non-thermal microwave radiation in DPs induced by quantum electrodynamics (QED). Starlight is shown to always concentrate in larger DPs which in millimeter DPs produce the microwaves necessary to excite CN. CBR fluctuations observed in COBE are then primarily regions of stellar disks that contain millimeter DPs. Similarly, the light from distant quasars is redshift in interactions with submicron and micron DPs in dense clouds and AGN prior to reaching the earth, thereby holding in question the BB claim of an expanding Universe based on Hubble theory. With the CBR and the Hubble redshift both explained by cosmic dust, Einstein's Universe in dynamic equilibrium without expansion becomes far more credible cosmology for the origin of the Universe than the BB.

Keywords: Einstein, cosmology, big bang, QED, Mie theory

1. Introduction

Discovery of the CBR (Penzias & Wilson 1965) at a temperature of 3.5 K was soon interpreted (Dicke et al. 1965) as the spectrum of the BB posited to occur about 14 billion years ago. Gamow and others were quick to promote the BB as the cosmological model of the Universe. Today, the controversy between the BB and Einstein's Universe continues, but is proposed here resolved by DPs. Quasar light is shown to redshift in DPs to hold in question the expanding Universe claimed by Hubble while DPs are found to allow starlight to be redshift to microwave levels that excite CN to produce the CBR.

Historically, Guillaume (1896) showed the temperature of an isolated body in space subject only to radiation of the stars would be about 5-6 K. Similarly, Eddington (1926) determined the total light received by the earth to be equivalent to about 1000 stars of the first magnitude. Allowing for an average correction to reduce visual to bolometric magnitude for stars other than F and G gave 2000 stars of unity bolometric magnitude Over a 10 pc sphere radius, Eddington estimated the 2000 stars produced energy density U = 7.67×10^{-14} J/m^3. For a blackbody, the temperature T of space,

$$T = \sqrt[4]{\frac{cU}{4\sigma}} \qquad (1)$$

where, σ is the Stefan-Boltzmann constant, and c is the speed of light On this estimate, Eddington found the temperature T = 3.18 K.

Eddington's blackbody temperature applied to a region of space not in the neighborhood of any star. Even so, it was fortuitous that his estimate of the CBR temperature would come so close to that of COBE. In the 1920's like today, estimates of the energy density U of the Universe from the number and magnitude of stars cannot hope to approach the precision of COBE. Like many astronomers today, Eddington was unaware that a lack of specific heat in DPs precludes any temperature increase, and therefore erroneously showed for an assumed star distribution, space temperatures occur far higher than the blackbody temperature.

Nernst (1928) developed a cosmological model for the Universe in dynamic equilibrium where the present fixed stars cool continually while new stars are formed. Nernst proposed a "tired light" explanation of the Hubble redshift by allowing the absorption of light by the luminiferous ether to decrease the energy and frequency of intergalactic light noting (Nernst 1937) that the redshift by the ether was not due to a receding Universe. Excluding the now questionable ether explanation of the Hubble redshift, the Nernst cosmological model is essentially that of Einstein. Indeed, Nernst found the temperature of intergalactic space to be 0.75 K (Nernst 1938).

In contrast, Alpher and Herman (1948) argued the CBR is the remnant of the BB. Gamow (1961) gave the temperature T of the Universe by,

$$T = \frac{1.5x10^{10}}{\sqrt{t}} \qquad (2)$$

where, t is the time since the beginning of the Universe in seconds. For the present age of the Universe, $t \sim 10^{17}$ s giving $T \sim 50$ K. Similar to Eddington's temperature of space at 3.18 K, Gamow's estimate of 50 K is also fortuitous, as the precision necessary to estimate the time t of expansion in the BB with that of COBE is not possible. Prior to Penzias and Wilson (1965), predictions of the temperature of space that do not rely on the BB expansion are closer to the COBE temperature of 2.726 K than that given by Gamow, but this is irrelevant because the cosmology of the Universe should be decided on its merits and not on initial estimates.

In this regard, CN was shown (Roth et al. 1993) to almost precisely reproduce COBE at the far reaches of the Universe assuming the CBR from the BB was available to excite the CN rotation frequency. However, Meyer (2008) claimed COBE only measured the CBR shortward of the galaxies. Regardless, ubiquitous CN as a variant of molecular hydrogen in Einstein's Universe is implied by the survey (Gilmon et al. 2006) with the Far Ultraviolet Spectroscopic Explorer (FUSE). Correlations of FUSE with CN for comparison with COBE have not been performed.

Recently, the Leiden/Argentine/Bonn (LAB) survey provided the 21 cm map of galactic H1 (Kalberla et al. 2005). LAB showed abundant atomic hydrogen is available in the far reaches of the Universe, but nothing about CN. With regard to the CBR, small anisotropy differences (Spergel 2007) were surveyed with the Wilkinson Microwave Anisotropy Probe (WMAP). In WMAP, very small differences in CBR temperature in the early Universe at its far reaches are detectable. However, the WMAP survey was placed in question by the claim (Verschuur 2007) that the CBR is caused by foreground atomic hydrogen. Verschuur argued the H1 was ionized to the H11 state that would produce electrons with attendant EM emission that is interpreted in COBE as the CBR from the outer reaches of the Universe when in fact it is from the Milky Way foreground. However, statistical analysis (Land & Slosar 2007) showed no significant correlation between the LAB and WMAP surveys. COBE was always intended to give the CBR of the early Universe, unlike (Verschuur 2007) and (Meyer 2008) who claimed COBE essentially measured foreground CBR.

The fact that atomic hydrogen reacts with itself to form molecular hydrogen suggests the lack of atomic hydrogen in correlations between LAB and WMAP is one of molecular hydrogen or CN. If so, LAB and WMAP should anti-correlate, but this was not observed (Slosar 2008). Moreover, statistical analysis of FUSE and WMAP is not planned (Slosar 2008).

In this paper, the CBR in Einstein's Universe is proposed to be CN emission excited by microwaves produced from redshift starlight in DPs. Similarly, the redshift of light from distant quasars is explained by QED induced redshift in DPs instead of Doppler effects in Hubble's law. Moreover,

(1) Starlight in DPs not only produces the CBR, but also the spectrum of the interstellar medium (ISM) from the ultraviolet (UV) through the visible (VIS) to the far infrared (FIR). The QED induced EM radiation is non-thermal and directly excites chemical species carried by the DPs, the DPs remaining at the CBR temperature of 2.726 K. E.g. the unidentified infrared (UIR) bands are produced by exciting the polycyclic aromatic hydrocarbons (PAH) molecules in DPs with the infrared (IR) content of the ISM continuum (Prevenslik 2008). It is incorrect to explain UIR bands (Li & Draine 2002) by exciting the PAHs with the thermal emission from the heating of DPs by UV or VIS starlight to 40 to 1000 K.

(2) Classically, the absorption of EM radiation by macroscopic bodies is conserved by an increase in temperature that subsequently undergoes thermal emission. Non-thermal radiation is excluded. However, classical theory is valid only for macroscopic bodies and not valid for micron and submicron DPs near absolute zero that lack the specific heat to conserve the absorbed EM radiation by an increase in temperature (Prevenslik 2008).

(3) The DPs are treated as Planck oscillators conserving absorbed starlight by the emission of QED induced EM radiation because the specific heat of DPs is shown to vanish at typical EM confinement frequencies. DP distributions (Maiolino & Natta 2002) allow the claim that the CBR is the CN rotation frequency excited by microwaves from redshift starlight in millimeter DPs present in stellar disks while the redshift in Hubble's law is redshift quasar light in submicron and micron DPs present in AGN and dense clouds.

2. Purpose.

The purpose of this paper is to show Einstein's Universe with cosmic dust treated as Planck oscillators is consistent with the COBE finding of CBR at 2.726 K while providing a non-velocity redshift alternative to the expanding Universe given by Hubble theory.

3. Theory and Analysis

QED induced EM radiation provides the theory by which DPs produce (1) the CBR by inducing starlight to redshift to microwave levels that excite the CN rotational frequency, and (2) the redshift of light from distant quasars (Prevenslik 2008).

QED induced EM radiation (Prevenslik 2004) finds basis in creating photons of wavelength λ by supplying EM energy to a quantum mechanical (QM) box having walls separated by $\lambda/2$. In this regard, it has been known for some time (Mie 1908) that EM radiation having half-wavelength short in relation to the DP diameter is fully absorbed. If the DPs are absent specific heat, the absorbed EM radiation cannot be conserved by an increase in temperature, so conservation proceeds by the emission of EM radiation at the QM confinement frequency. Starlight absorbed in DPs is induced to undergo prompt redshift by frequency down-conversion to the EM confinement frequency of the DP. The CN excitation necessary to produce the CBR requires millimeter DPs, although submicron and micron DPs produce the redshift from quasar light at VIS frequencies. Efficiency in QED induced redshift is very high and only a single starlight or quasar photon is needed to produce the QED induced photons.

In contrast, blueshift of starlight is far less efficient and is only applicable to the continuous irradiation of the DPs. Blueshift of single photon starlight is not possible because at least more than one starlight photon is required to conserve the Planck energy of the blueshift photon. However, the CBR may be considered a continuous source of EM radiation. In fact, the ISM spectrum was shown produced by blueshift CBR provided Mie efficiency is enhanced by multiple interactions of Mie absorptions and QED emissions in a distribution of DPs (Prevenslik 2008).

EM Confinement Frequency The EM confinement frequency f is a statement of the boundary conditions imposed on the absorbed starlight confined in the DP. The DPs are taken to be spherical of diameter D (=2R) depicted in Fig. 1.

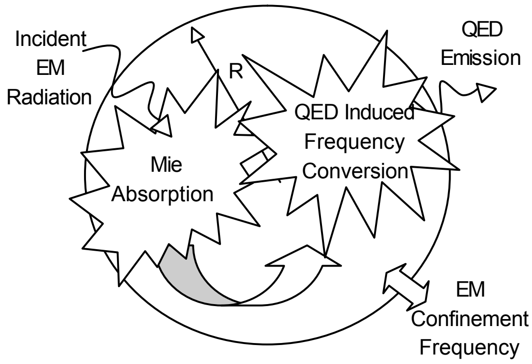

Figure 1 QED Induced EM Radiation in DPs

The Planck energy E_P and wavelength λ_{EM} under EM confinement of the absorbed CBR,

$$E = \frac{hc}{\lambda_{EM}}, \quad \lambda_{EM} = 2Dn_r, \text{ and } \quad f = \frac{c}{\lambda_{EM}} \tag{3}$$

where, h is Planck's constant, and n_r is the refractive index of the NP.

Mie Absorption Efficiency The Mie absorption Q_{abs} efficiency for DPs smaller than the starlight wavelength λ is given by (Bohren & Huffman, 1983),

$$Q_{abs} = 4X\,\mathrm{Im}\left(\frac{m^2 - 1}{m^2 + 2}\right) = \frac{24\pi abD/\lambda}{\left(a^2 + b^2 + 2\right)^2 + 4a^2b^2} \tag{4}$$

where, Im means the imaginary part; X is the size parameter, $X = 2\pi R/\lambda = \pi D/\lambda$; and m is the DP complex refractive index, m = a –bi.

Vanishing Planck Energy and Specific Heat In the Einstein-Hopf harmonic oscillator, the vibration of the photons produces an average Planck energy E_{avg} as shown in Fig. 2. At $\lambda \sim 1000$ microns, E_{avg} is about 25 x smaller than the nominal value at 2.726 K. For $n_r \sim 2$, E_{avg} vanishes for DP diameters $D = \lambda/2n_r \sim 250$ microns. For CN excitation at 2.64 mm, $E_{avg} \sim 0.0001$ eV.

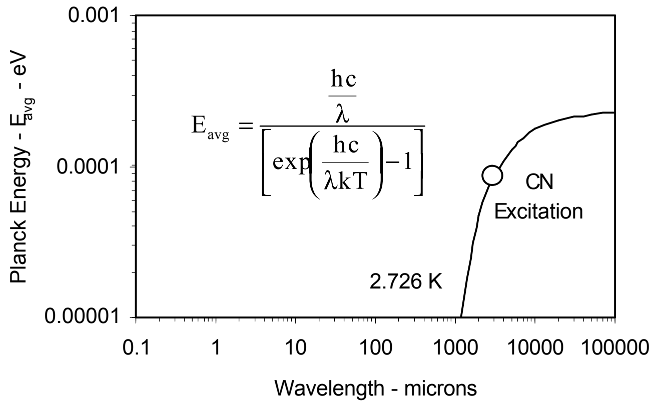

Figure 2 Harmonic Oscillator at 2.726 K

Unlike the Debye specific heat, the NP atoms do not vibrate. Instead, the QED photons oscillate at the EM confinement frequency f as the starlight photon adjusts to the DP geometry. Fig. 3 depicts the specific heat C* at about $\lambda \sim 1000$ microns to be about 10 x lower than the nominal value at 2.726 K. Effectively, E_{avg} vanishes for DP diameters $D = \lambda/2n_r \sim 250$ microns. For CN excitation at 2.64 mm, C* = 0.7.

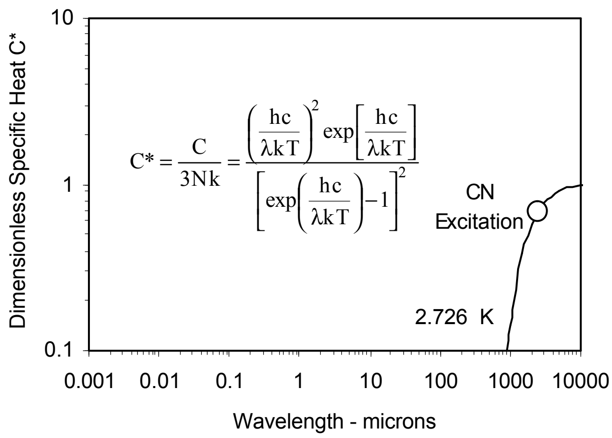

Figure 3 Dimensionless Specific Heat C* at 2.726 K

<u>Modified Stefan-Boltzmann Equation</u> The classical Stefan-Boltzmann (SB) equation for radiative heat Q_{SB} transfer assumes unity Q_{abs},

$$\frac{Q_{SB}}{A} = \sigma\left(T_{BB}^4 - T^4\right) \tag{5}$$

where, σ is the Stefan-Boltzmann constant and A is the DP area. T and T_{BB} are the absolute temperatures of DP and surroundings. Beyond excluding Mie absorption efficiency, the SB equation assumes the DP has specific heat to conserve absorbed starlight or the CBR by an increase in temperature T.

Since the Einstein specific heat vanishes, the modified SB equation for DPs including Mie absorption efficiency Q_{abs} is,

$$Q_{SB} = \sigma A Q_{abs} T_{BB}^4 - E_P \frac{dN_P}{dt} = Mc_P \frac{dT}{dt} = 0 \qquad (6)$$

where, Q_{abs} is taken to be unity in multiple interactions, M is the DP mass, dT/dt is the rate of DP temperature change, dN_P/dt is the rate of QED induced photons produced having Planck energy $E_P = hc/2Dn_r$. At steady state,

$$\frac{dN_P}{dt} = \frac{\sigma A Q_{abs} T_{BB}^4}{E_P} = \frac{2\pi\sigma Q_{abs} n_r T_{BB}^4 D^3}{hc} \qquad (7)$$

3. Discussion

CBR by QED Induced Starlight Contrary to Wright (1982,1988) the CBR produced by starlight need not be based on the thermalization of needles. By QED, starlight absorbed in DPs is redshift to microwaves that excite the rotational CN frequency without any increase in temperature. In fact, CN is known (Roth et al. 1993) to emit EM radiation that precisely matches the CBR. For CN at the rotational frequency of 2.64 mm, the corresponding DP diameter is $D = \lambda / 2n_r < 0.66$ mm. But it is not necessary for the DP diameter to precisely match the CN excitation wavelength.

Generally, the EM radiation induced by QED is continuous broadband emission over a range from the wavelength of the absorbed starlight to the DP wavelength because the starlight photon in adjusting to the EM confinement of the DP excites all intermediate wavelengths continuously. The only way a specific CN quantum state may be excited is for the excitation to be continuous over a range of wavelength that includes the quantum state. For the CN at 2.64 mm to be excited, the DPs therefore need only to have diameter $D > \lambda /2n_r = 0.66$ mm. Hence, the CBR produced by excited CN most likely occurs in stellar disks (Maiolino & Natta 2002) having ($a_{max} \sim 1$-10 mm).

Quasar Redshift by QED Light from distant quasars absorbed in submicron and micron DPs is induced by QED to redshift without a receding Universe. For a quasar photon of wavelength λ absorbed in a DP having diameter $D = \lambda / 2n_r$, the redshift Z for QED induced wavelength λ_{QED} is,

$$Z = \frac{\lambda_{QED} - \lambda}{\lambda} \qquad (8)$$

Unlike the millimeter DPs necessary for producing the CBR, QED induced redshift of quasar light occurs in submicron and micron DPs present (Maiolino & Natta 2002) in dense clouds ($a_{max} \sim 0.50$ microns), and AGN ($a_{max} \sim 1$-10 microns).

QED induced redshift is not the same as "tired light" where quasar light from interactions with DPs is claimed to redshift because it loses energy, the typical rebuttal of which is:

> "There is no known interaction that degrades a photon's energy without also changing its momentum, which leads to a blurring of distant objects which is not observed." (Wright 2000).

In DPs, QED always conserves absorbed quasar light with that of the redshift emission. Redshift does not occur because the incident quasar photon loses EM energy, but rather because QED reduces its frequency. For any redshift Z, the conservation of EM energy and momentum are,

$$E = \frac{hc}{\lambda} = N\frac{hc}{\lambda_{QED}} \quad \text{and} \quad \frac{E}{c} = \frac{h}{\lambda} = N\frac{h}{\lambda_{QED}} \qquad (9)$$

where, N is the number of QED photons produced, $N = \lambda_{QED} / \lambda > 1$. QED induced redshift therefore occurs with the quasar light and the redshift QED photons having the same momentum.

Peak Spectral Power and CN Excitation In Einstein's Universe, the CBR is given by the CN emission at 2.64 mm. Since spectral density may peak at wavelengths higher or lower than 2.64 mm, another point is required to uniquely define the blackbody spectral power relation.

In QED induced EM radiation, the DPs redshift absorbed starlight because the vanishing Planck energy and specific heat do not allow the absorbed starlight to be conserved by an increase in temperature. Equivalently, the Planck energy and specific heat of the DP tends to vanish. Fig. 4 shows this occurs near 1064 micron for the spectral power radiated from a blackbody at 2.726 K. The combination of CN emission at 2.64 mm and the peak spectral power at a wavelength < 2.64 mm is therefore sufficient to uniquely define the blackbody relation for the CBR.

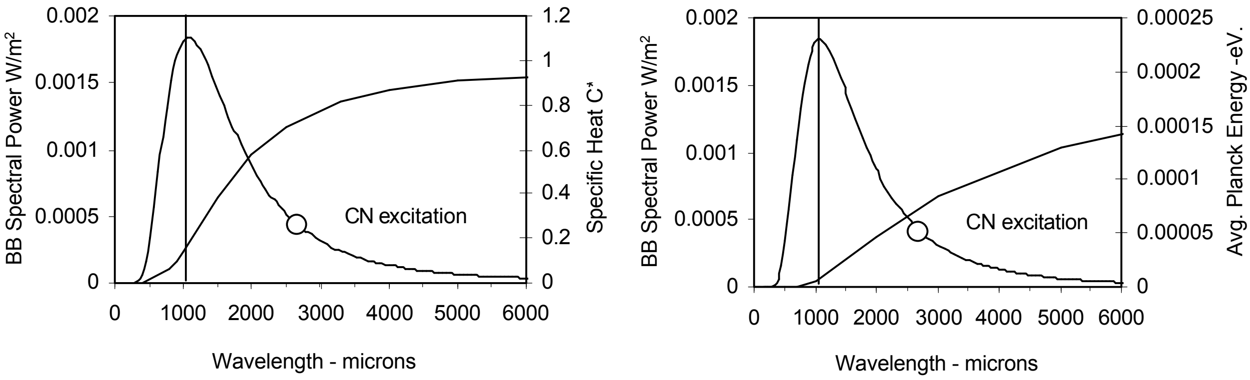

Figure 4 Vanishing Planck Energy and Specific Heat

The peak spectral power occurring near 1064 microns is observed to coincide with low Planck energy and specific heat, although the tail of both does not actually vanish until λ < 500 microns. What this means is the absorbed starlight is conserved by thermal emission for λ > 1064 microns. But for λ < 1064 microns, conservation occurs by both thermal and non-thermal emission. This suggests vanishing Planck energy and Einstein specific heat are important parameters that allow the CBR to be given by CN emission at a temperature of 2.726 K.

Microwaves by Redshift Starlight In a DP distribution having diameters D from the submicron to millimeters, the CBR viewed as CN emission excited by 2.64 mm microwaves is shown to produce redshift starlight. However, the efficiency of the starlight conversion to CBR is reduced because the starlight may also be absorbed in submicron and micron DPs. Numerical simulation of the conversion efficiency of starlight to CBR was based on 500 DPs with diameters D selected randomly over a range from 0.1 to 500 microns. The number density of DPs was taken as 10^{-6} / m^3 corresponding to about 1 DP in cubical box having 100 m sides. The conversion of starlight to CBR is illustrated in Fig. 5.

The curve marked CBR was generated by imposing a blackbody flux ($\sigma T^4 \sim 3x10^{-6}$ W/m^2) to all DPs. The power W absorbed by the 0.1 micron DPs is about 12 orders of magnitude less than that absorbed by the 500 micron DP. The curves marked 0.5, 10, and 100 microns are starlight from the VIS to the FIR at the same BB flux used in the CBR curve. Inflexion points on the curves occur at the starlight wavelength.

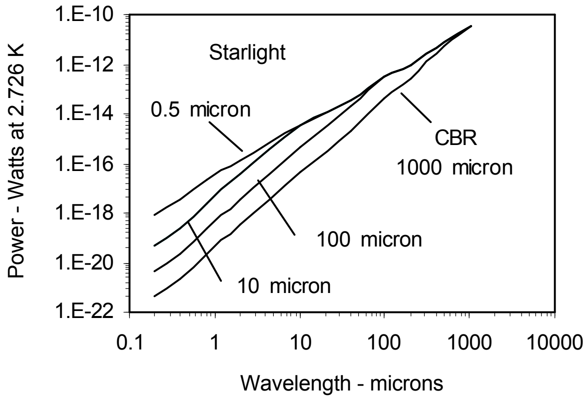

Figure 5 Starlight Conversions to CBR

Of importance is that all starlight from 0.5 to 100 microns tends to concentrate in the 250 micron DP, e.g., the VIS photon at 0.5 microns is not easily absorbed by submicron DPs, but rather repeatedly scattered only to be eventually absorbed by 250 micron DPs. By conserving EM energy, the 0.5 micron VIS photon in a NP having 250 micron diameter produces about 2128 CBR photons at 1064 microns. Or, the VIS photon may be absorbed in a DP with D = 20 micron to produce 26 photons in the FIR at 80 microns, or and so forth.

Specific Heat of DPs Historically, DPs having an entire heat capacity comparable to the Planck energy of the single UV photon were thought to cause large temperature fluctuations (Purcell 1976) and even more recently, the UIR bands have been explained (Draine & Li 2001) by temperature increase of 40-1000 K upon heating by UV and VIS photons. QED induced EM radiation differs in that the UIR bands form without the DPs increasing in temperature. Moreover, DP heating to produce the UIR bands by thermal emissions are highly unlikely because the DP specific heat already low at 2.726 K vanishes at typical EM confinement frequencies.

Opaqueness and Efficiency of DPs as CBR Source The CBR produces blackbody radiation at 2.726 K because the specific heat of DPs vanishes at 1064 microns. However, DPs are claimed (Wright 2000) to not be the source of blackbody radiation because there are not enough of them to be opaque, the opaqueness necessary to produce a blackbody spectrum. Wright (2000) also claims DPs do not radiate efficiently at millimeter wavelengths.

Opaqueness in a DP of diameter D is not of importance in QED induced redshift because the starlight photon having half-wavelength $\lambda / 2n_r << D$ is fully absorbed according to Mie theory (Bohren & Huffman 1983). In Mie theory, there is no requirement for collective opacity of DPs.

Questions of radiation efficiency at millimeter wavelengths beginning with (Wright 1982) and more recently in the FIR (Li & Draine 2002) are based on the notion that DPs must be heated to high temperatures to be thermal emitters at microwave and FIR frequencies. However, DPs as the source of the CBR need not rely on thermal emission at microwave frequencies , but rather on QED induced emission that only requires a source of millimeter DPs, e.g., diameters D > 0.66 mm to produce λ = 2.64 mm microwaves. Such likely DP locations (Maiolino & Natta 2002) are: stellar disks (a_{max} ~ 1-10 mm).

CBR by Interstellar Gas Temperature The astronomer Heinrich Olbers conceived the following paradox. When an observer is looking in a particular direction toward a homogeneous Universe, a star should always be visible in any direction since there is no limit in the distance of observation. Consequently, Olbers concluded that the night sky should be bright and not dark.

At night, an observer sees only the stars because our eyes are only sensitive in the VIS, the remaining space appearing dark and not bright. The problem is the Universe is not emitting VIS light everywhere. Rather, the vast extent of the Universe is emitting very long wavelength 1064 micron radiation. Olbers could not have known of Planck's radiation that came later to conclude the Universe should be bright at 1064 microns, a fact that was recently supported by COBE that showed the CBR to follow with great precision Planck's blackbody temperature of 2.726 K.

The CBR blackbody temperature of the Universe need not be attributed solely to the BB. Indeed, Marmet (1988) proposed the blackbody temperature is the natural consequence of the Universe filled with gases, mostly hydrogen that would produce uniform CBR over the whole sky. But this is inconsistent with the spotted CBR map of COBE. Molecular hydrogen or CN alone is not sufficient to produce the CBR because DPs in the millimeter range from nearby stellar disks are required to excite the CN consistent with the CBR map of COBE.

4. Summary of Conclusions

Conclusions on the CBR are as follows.

(1) The BB as the sole source of CBR is placed in question by the CBR produced from the QED induced interaction of single photon starlight with DPs, the absorbed starlight redshift in millimeter DPs to the microwave levels necessary to excite CN.

(2) The CBR occurs at 2.726 K because the CN molecule is excited by 2.64 mm microwaves, the microwaves produced from the absorption of starlight in DPs having diameters D > 0.66 mm. The DPs always remain at 2.726 K.

(3) CN is ubiquitous throughout Einstein's Universe. However, the CBR by excited CN is not uniform over the whole sky because DPs in the millimeter range required to produce microwaves that excite the CN are only present in stellar disks.

(4) Statistical analysis in the WMAP survey should be extended to possible CBR correlations with locations of sub-millimeter DPs.

Conclusions on the Hubble redshift are:

(5) The Hubble redshift based on the Doppler Effect that supported the expanding Universe in BB theory is placed in question by QED induced redshift in the absorption of quasar light in submicron and micron DPs present in AGN and dense clouds.

(6) Unlike "tired light", QED induced redshift reduces the frequency of starlight absorbed in DPs while conserving the starlight photon energy, and therefore there is no change in the momentum of incident photon to blur the image characteristic of "tired light".

Conclusions on the ISM Spectrum are:

(7) The ISM spectrum may be produced in DPs from redshift single photon starlight, but blueshift is not possible because the Planck energy of the blueshift photon can not be conserved with a single starlight photon.

(8) Unlike single photon starlight, the CBR is a continuous source of EM radiation. The ISM spectrum from the VIS to the FIR may therefore be produced by the blueshift of CBR provided a distribution of DPs is present for multiple interactions that allow unity Mie absorption efficiencies.

General conclusions are:

(9) Classical heat transfer that conserves the absorption of EM energy by temperature increases in macroscopic bodies is not valid for micron and submicron DPs at temperatures near absolute zero. Conservation of absorbed EM energy in DPs may only occur by the emission of EM radiation - the process called QED induced EM radiation.

(10) Vanishing specific heat precludes UV and VIS radiation from nearby stars producing the UIR bands by exciting PAH molecules by the thermal emission following the heating DPs to temperatures of 40 - 1000 K.

5. Overall Conclusion

Both the CBR and Hubble redshift are explained by QED induced EM radiation of cosmic dust. Einstein's Universe in dynamic equilibrium without expansion therefore becomes far more credible cosmology for the origin of the Universe than the unverifiable BB. More work is required to verify the conclusions in this preliminary paper, although the credibility of Einstein's Universe compared to the speculative BB is independent of further analysis.

References

Alpher, R.A. & Herman, R., 1948, Nature 162, 774-775.
Bohren, C.F. & Huffman, D.R., 1983, *Absorption and Scattering of Light by Small Particles*, J. Wiley & Sons, New York.
Dicke, R.H., Peebles, P.J.E., & Wilkinson, D.T., 1965, ApJ, 142, 414-419.
Eddington, A.S., 1988, *The Internal Constitution of the Stars*, Cambridge University Press, Reprint of 1926 Ed.
Gamow, G., 1961, *The Creation of the Universe*, Viking, Revised Ed.
Gilmon, K., Shull, J. M., Tumlinson, J. & Danforth, C., 2006, ApJ, 636, 891.
Guillaume, C.E., 1896, *La Nature* 24, Series 2, 234.
Kalberla, P.M.W., Burton, W.B., Hartmann, Dap, Arnal, E.M., Bajaja, E. Morras, R. & Pöppel, W.G.L. 2005, A&A 440, 775-782.
Land, K. & Slosar, A., 2007, Phys. Rev. D, 76, 087301.
Li, A. & Draine, B.T., 2002, ApJ, 572, 232.
Maiolino, R. & Natta, A., 2002, Astrophys. and Space Science, 281, 233-42.
Marmet, P., 1988, Sci.Lett., 240, 705.
Meyer, D.M., 2008, Personal Communication.
Mie, G., 1908, Ann. Phys., 339, 337.
Nernst, W., 1928, Journal of the Franklin Institute 207, 135-142.
Nernst, W., 1937, Zeitschrift fur Physik 106, 633-631, English Translation by Peter Huber *et al.*
Nernst, W., 1938, Annalen der Physik 32, 44-48, English Translation by Gabriella Moesle.
Penzias, A.A. & Wilson R.W., 1965, ApJ 142, 419-421.
Prevenslik, T.V., 2004, <http://www.geocities.com/sonoluminescence2004>
Prevenslik, T.V., 2008, Proc. IAU Symp. 251, *Organic Matter in Space*.
Purcell, E.M., 1976, ApJ, 206, 685.
Roth, K.S., Meyer, D.M. & Hawkins, I., 1993, APJ, L67-L71.
Spergel, D.N., et al., 2007, Astrophys J. Suppl. Ser., 170, 377-408.
Slosar, A., 2008, Personal Communication.
Verschuur, G., 2007, Phys. Rev. D., 76, 087301.
Verschuur, G., 2008, Personal Communication.
Wright, E.L., 1982, ApJ, 205, 401-7.
Wright, E.L., 1988, ApJ, 324, 46-59.
Wright, E.L., 2000, <http://www.astro.ucla.edu/~wright/errors.html>