

COSMIC MICROWAVE BACKGROUND RADIATION

According to 'MATTER (Re-examined)'

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Abstract: Various types of irrational inflationary models of the universe were introduced to oppose the possible accumulation of all material bodies at a point due to gravitational attraction between them. As no logical mechanism could produce an inflationary universe and maintain its stable state, diverse assumptions, including the big bang origin of the universe, were proposed. As no known origin for CMBR was readily available, it was accepted as proof of these assumed theories. However, CMBR has a logical reason and definite mechanisms of production. These are not linked to big bang creation or the inflationary state of the universe but to its steady state of existence.

Keywords: Background radiation, photons, big bang, steady state of universe.

Introduction:

The advent of theories on gravitational attraction necessitated that all material entities gather at a point. This was contrary to common sense and observation of the universe as a whole. As no known physical phenomena could explain the widespread and somewhat even distribution of macro bodies, it became necessary to invent new phenomena that could neutralise actions by the gravitational attraction between macro bodies in our large-scale universe. Different proposals were considered by physicists at various times and discarded as their creditability could not be maintained for long. Although quite opposed to common sense, current phenomena that have wider appeal are those related to cosmic inflation theories and the 'Big Bang' creation of the universe. Many physical phenomena are currently misinterpreted to provide creditability to these theories.

One of the misinterpreted phenomena is the presence of cosmic microwave background radiation (CMBR or relic radiation), discovered in the 1960s. Three of the most prominent irrational assumptions by which the presence of CMBR is misinterpreted and exploited to support the inflation theories of the universe are: 1). Although space has neither a form nor an objective existence, it is linked to a functional entity, time, to create another formless entity, the space-time continuum, that is able to deform and

expand. 2). Although it is believed that during cooling, material bodies contract in size, the universe is considered to cool during its expansion. 3). Although light is assumed to be a massless entity that radiates through a vacuum, it is considered to behave like sound, which is a wave motion of pressure differences in material medium. Many other phenomena, like the chronological development of the universe, gravitational waves, photon de-coupling, etc., are also assumed at various stages to support these theories.

An alternative concept, presented in the book 'MATTER (Re-examined)' [1], provides logical and consistent explanations for the presence of CMBR, gravitational attraction, and the steady state of the universe. This article is a very brief summary taken from the same. All conclusions expressed here are based on it. For details, kindly refer to the same.

Radiation:

Radiation may be classified into two categories: radiation of energy (work) not associated with 3D matter and radiation of 3D matter with associated energy (work). Electromagnetic waves are examples of the radiation of energy (work) not associated with 3D matter. They transfer work (structural distortions) in the universal medium from one place to another in the form of cyclic variations in structural distortion-density. The radiation of 3D matter is in the form of a continuous flow of photons in the universal medium. Heat rays, light rays, X-rays, gamma rays, and cosmic rays are examples of radiation of 3D matter with associated energy (work).

Electromagnetic wave:

Due to the self-stabilising latticework structures of the universal medium, structural distortions in it cannot remain in one locality. They are transferred from the higher distortion-density region to the lower structural distortion-density region. Once the movements of structural distortions have begun, they can be stopped only by external intervention. Cyclic variations of structural distortions in the universal medium create a moving wave-like difference in the structural distortion-density of the universal medium. Except for production and reception, they are not associated with 3D matter particles. Hence, they are transmitted through the universal medium at the highest possible speed in straight-line paths. The highest possible linear speed through the universal medium is that of light. As both electric and magnetic information are associated with the waves of difference in structural distortion-density in the universal medium, they are generally known as electromagnetic waves.

Photon:

Photons are corpuscles of light or other radiation of 3D matter with associated energy (work). Each photon has a segmented, spherical (disc-shaped) core of 3D matter, formed by a group of quanta of matter under compression from the universal medium. The 3D matter-core of each photon is surrounded by a structurally distorted region in the universal medium called the inertial-pocket. The inertial-pocket continuously moulds the enclosed 3D matter-core into appropriate shapes, maintains its integrity and stability, moves it at the highest possible linear speed, and spins it about one of the 3D matter-core's diameters at a spin speed proportional to its 3D matter-content. Inertial-pockets, being structural distortions in the universal medium, are transferred at the highest possible linear speed through the universal medium. A moving inertial-pocket carries the 3D matter-core of a photon along with it. Structural distortions in an inertial-pocket in any transverse plane (to its linear path) appear similar to an electromagnetic wave. Thus, photons (the light and all other types of radiation) came to be equated with electromagnetic waves. However, radiations of 3D matter have a dual nature, consisting of 3D matter as the 3D matter-cores of photons and associated structural distortions in the inertial-pocket (separately in each plane) as electromagnetic waves. The photon's 3D matter-core spins about one of its diameters, perpendicular to the photon's linear path.

The stability of the 3D matter-core is sustained by maintaining its internal pressure (due to the tendency of constituent quanta of matter to expand) equal to the external pressure on it by gravitational actions from the universal medium. In the stable state of a photon's 3D matter-core, its internal pressure is the highest that 3D matter can be compressed to, at which the matter-density of 3D matter is equal to the matter-

density of a quantum of matter. The enlargement of the 3D matter-core, due to any reason, lowers its internal pressure and permits quanta of matter to escape from the photon's 3D matter-core. Similarly, a tendency to increase its internal pressure supports the assimilation of quanta of matter from the surrounding universal medium.

In order to maintain the stability of a photon's 3D matter-core, gravitational actions by the universal medium are aided by external pressure created by the movements of the 3D matter-core through the universal medium. All actions on a photon's 3D matter-core, including its movements, are carried out by the gravitational actions of the universal medium. A stable photon has synchronised movements between its inertial-pocket and 3D matter-core. Attempts to deflect its path or vary the linear or spin motions of the 3D matter-core destabilise the photon and initiate the stabilisation process by the universal medium (inertial-pocket). Deflection of the photon's path compels the universal medium to produce additional structural distortions in the inertial-pocket, so that the additional stress produced tends to straighten its path. Variations in the (linear or spin) speeds of the 3D matter-core change its internal pressure and result in assimilation or abandonment of matter-content.

Inertial-pockets, being structural distortions in the universal medium, unattached to superior 3D matter-particles, can move only at the critical speed of light. Attempts to move the 3D matter-core faster, with respect to the inertial-pocket tend to enlarge it by increasing internal pressure. The forward part of the 3D matter-core presses into the inertial-pocket and assimilates quanta of matter from the universal medium into it. As a result, the 3D matter-content of the photon increases to neutralise the action of external effort. An increase in the 3D matter-content increases the photon's spin speed (frequency). Thus, attempts to increase a photon's linear or spin speeds increase its frequency rather than its speed. Similarly, an attempt to slow down the 3D matter-core of a photon with respect to its inertial-pocket, reduces external pressure on the 3D matter-core so that few quanta of matter from the 3D matter-core escape into the universal medium. As a result, the matter-content of the photon decreases to neutralise the action of external effort. A reduction in the 3D matter-content reduces the photon's spin speed. Thus, attempts to reduce a photon's spin speed reduce its frequency rather than its speed.

Tired light:

The 3D matter-core of a photon is disc-shaped, and it spins about one of its diameters while moving in a linear direction at the speed of light. Due to the super positioning of the photon's linear and spin motions, the forward spinning segment of its 3D matter-core moves slightly faster and the rearward spinning segment moves slightly slower, so the average linear speed of the whole photon is stable at critical linear speed. Centrifugal action on the 3D matter-core maintains its faster-moving (forward spinning) segment slightly larger than its slower-moving (rearward spinning) segment. The centre of spin motion is displaced from the geometrical centre towards the forward spinning segment. Hence, in the stable state of a photon, the difference in linear speed with respect to the critical speed of light is less for the forward spinning segment compared to the rearward spinning segment.

During a photon's travel through large distances in space, the faster-moving segment of its 3D matter-core slowly and gradually assimilates quanta of matter from the universal medium into its 3D matter-content. At the same time, the slower-moving segment of its 3D matter-core slowly and gradually discards quanta of matter into the universal medium from its 3D matter-content. The magnitudes of differences in speeds are reflected in the number of quanta of matter accumulated in the forward-spinning segment and the number of quanta of matter discarded by the rearward-spinning segment. Every half-spin, the roles of segments of 3D matter-core reverse. Thus, there is a gradual but steady funnelling of quanta of matter (matter-content) through the 3D matter-core of a stable photon.

The change in quantity of 3D matter in a photon's 3D matter-core is the sum total of the quanta of matter assimilated into it and discarded from it. The resulting linear speed of the rearward turning segment of the photon's 3D matter-core differs by a greater margin from the critical linear speed. Hence, the rate of loss of quanta of matter from the photon's 3D matter-core through the rearward-spinning segment is greater than the rate of gain of quanta of matter through the forward-spinning segment. The rate of exchange of a photon's 3D matter-content is too small and facilitates only a gradual loss of its 3D matter-

content during the photon's travel through very large distances in space. Thus, photons travelling very large distances in space gradually lose their 3D matter-content and thereby lower their frequency. This is one of the reasons that gives rise to the phenomenon of the 'redshift' noticed in the frequency of light radiated from regions near macro bodies at great distances.

Redshift is a phenomenon in which the original frequency of light or other types of radiation is lowered during the course of their travel through large distances in space. The greater the distance of a macrobody from the observer, the greater the shift in frequency of radiation received from the region near that macrobody. The frequency of light gradually shifts towards the red-side of the visual spectrum. Light appears exhausting during its travel and lowers its frequency due to a loss of 3D matter-content. Hence, this trend is also known as the phenomenon of 'tired light'.

Higher-frequency photons have a greater speed difference between the forward-spinning and rearward-spinning segments of their 3D matter-cores. Hence, higher-frequency radiations are red-shifted by a greater rate compared to lower-frequency radiations. If the distance travelled is very large, many photons lose their entire 3D matter-content and cease to exist in this way. Hence, depending on their frequency, there is a limit on the rate of transmission of photons. The phenomenon of redshift causes a reduction in the magnitude of light received by us on earth (presumably) from distant macrobodies in the universe, making the night sky dark ('Olbers' Paradox').

Radiations of light from macrobodies beyond certain distances do not reach us on earth. They would lose all their 3D matter- contents (so that the residuals of the dead photon do not exist any more as photons) during their travel (presumably) from regions of a distant macrobody towards the earth. The case is similar with respect to all other radiations (of 3D matter). Consequently, there is a limit on the distance in space to any macro body from which observers on earth may receive information. This sets a limit on the extent of the universe for the observer. The extent of the universe for an observer is equal in all directions, and the observer is always at the centre of the (observable) universe.

Resisted light:

As photons in radiation are already moving at the highest possible linear speed, no external effort in the direction of their linear motion can act on them. However, external efforts in other directions are able to affect their motion. External efforts may try to increase or reduce their linear speeds. Gravitational attraction between the 3D matter-cores of photons, radiated away from the region of a very large macrobody (like a black hole), tends to resist the linear motions of the photons in the radiation. Attempts to reduce the linear speeds of photons compel them to lose 3D matter-content and reduce their frequency.

CMBR:

If the distance travelled by photons is large enough or the resistance to their linear motions is sufficiently strong and lasts long enough, they may lose all their 3D matter-content during travel. At the instant of complete loss of 3D matter-content, all photons have minimum (and equal) 3D matter content, and they are supported by the minimal possible inertial-pockets. After the loss of 3D matter-content by the photons, they cease to exist as corpuscles of radiation any more. However, they leave their minimal inertial-pockets as their residue in the universal medium. Inertial-pockets in all planes appear as electromagnetic waves.

Due to the even distribution of macro bodies in space, radiation (of light) from all regions of space is uniform, and residue inertial-pockets, left by the dead photons in all directions, towards any point in space are equal in magnitude. Hence, the electromagnetic waves, apparent from the residue inertial-pockets, are uniform in magnitude from all directions. As there is no definite origin and their magnitudes more or less remain constant in any direction, they are assumed to originate in the general cosmos and are called cosmic background radiation (CMBR). These are not related to any particular region, star, galaxy, or any other configuration in the universe.

Although the distribution of macrobodies and radiation in all directions is assumed to be uniform, the presence of very large macrobodies (black holes) is not very uniform around any point in space. Moreover,

radiation from these macro bodies produces a very high magnitude of resisted light to create a higher quantity of background radiation from their direction. Although these radiations are identical to those received from tired light, adding others may produce small fluctuations in the magnitudes of CMB radiation received from various directions.

Due to various other reasons, occasionally photons of higher 3D matter-contents may also lose their 3D matter-contents and leave stronger inertial-pockets as their residue. These may give rise to higher-frequency electromagnetic waves in the background that mix with cosmic background radiation.

Conclusion:

Production and distribution of CMBR have definite mechanisms that are not related to inflationary models of the universe. If big bang and inflationary models of the origin of the universe are avoided, equating the magnitude of the CMBR to cosmic temperature, heat level, and age of the universe has no meaning.

Reference:

[1] Nainan K. Varghese, *MATTER (Re-examined)*, <https://www.matterdoc.info/>

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