

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 to 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 the Big Bang creation or an inflationary state of the universe, but to its steady-state existence.

Keywords: Background radiation, photons, Big Bang, steady state of the 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 macrobodies, it became necessary to invent new phenomena that could neutralize the actions of gravitational attraction between macrobodies in a large-scale universe. Different proposals were considered by physicists at various times and discarded as their credibility could not be maintained for long. Although opposed to common sense, the 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 credibility to these theories.

One of the misinterpreted phenomena is the presence of cosmic microwave background radiation (CMBR or relic radiation), discovered during the 1960s. Three of the most prominent irrational assumptions by which the presence of CMBR are misinterpreted and exploited to support inflation theories of the universe are: 1) Although space has neither form nor 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 on 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 wave motions of pressure differences in a material medium. Many other phenomena, like the chronological development of the universe, gravitational waves, photon decoupling, 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 of the same. All conclusions expressed here are from it. For details, kindly refer to the same.

Radiation:

Radiation may be classified into two types: radiation of energy (work) not associated with 3D matter and radiation of 3D matter along with associated energy (work). Electromagnetic waves are examples of 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 distortion-density. 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 along with associated energy (work).

Electromagnetic wave:

Due to self-stabilizing latticework structures of the universal medium, structural distortions in it cannot remain in one locality. They are transferred from a region of higher distortion-density to a region of lower distortion-density. 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 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 waves of different distortion-density, they are generally known as electromagnetic waves.

Photon:

Photons are corpuscles of light or other radiations 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 an inertial-pocket. Inertial-pocket continuously moulds the 3D matter-core into the appropriate shape, 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-pocket, being a region of structural distortions in the universal medium, is transferred at the highest possible linear speed through the universal medium. The moving inertial-pocket carries the enclosed 3D matter-core of the photon along with it. Structural distortions in the inertial-pocket in any transverse plane (to its linear path) appear similar to an electromagnetic wave. Thus, photons (light and all other types of radiation) came to be equated with electromagnetic waves. However, radiation of 3D matter has a dual nature consisting of 3D matter in the 3D matter-cores of the photons and associated structural distortions in the inertial-pocket (separately in each plane) as electromagnetic waves. 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 of a photon 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 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. Enlargement of the 3D matter-core, due to any reason, lowers its internal pressure and permits a few quanta of matter to escape from the

photon's 3D matter-core. Similarly, the 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 the 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 synchronized movements between its inertial-pocket and 3D matter-core. Attempts to deflect its path or vary linear or spin speeds of 3D matter-core destabilize the photon and initiate a stabilization 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 (linear or spin) speeds of 3D matter-core change its internal pressure and result in the assimilation or abandonment of 3D 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. Attempting to move the 3D matter-core faster with respect to the inertial-pocket tends to enlarge it by increasing the 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 neutralize the action of external effort. Increased 3D matter-content increases the photon's spin speed (frequency). Thus, attempts to increase a photon's linear speed increase its frequency rather than its linear 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, permitting a few quanta of matter from the 3D matter-core to escape into the universal medium. As a result, the 3D matter-content of the photon decreases to neutralize the action of external effort. Reduction in its 3D matter-content reduces the photon's spin speed (frequency). Thus, attempts to reduce a photon's linear speed result in a reduction in its frequency rather than its linear speed.

Tired light:

3D matter-core of a photon is segmented spherical (disc-shaped), and it spins about one of its diameters, while moving in a linear direction at the speed of light. Due to the superposition of 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 that the average linear speed of the whole photon is stable at critical linear speed. Centrifugal action on the 3D matter-core maintains a faster-moving (forward spinning) segment slightly larger than the slower-moving (rearward spinning) segment. The centre of spin motion is displaced from the geometrical centre towards the forward spinning segment. Hence, in a stable state of photon, the difference of 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. Magnitudes of differences in the speeds of the segments are reflected in the quantities of quanta of matter accumulated into the forward-spinning segment and discarded by the rearward-spinning segment. Every half-spin, the roles of the segments of the 3D matter-core reverse. Thus, there is a gradual but steady funnelling of quanta of matter (3D matter-content) through the 3D matter-core of a stable photon.

Change in the quantity of 3D matter in a photon's 3D matter-core is the sum total of quanta of matter assimilated into it and discarded from it. Resultant linear speed of the rearward turning segment of the photon's 3D matter-core differs by a greater margin from 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 photon's 3D matter-content is too low and facilitates only a gradual loss of its 3D matter-content during photon's travel through very large distances in space. Thus, photons traveling 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 'red-shift' noticed in the frequency of light, radiated from regions near macrobodies at great distances.

Redshift is a phenomenon by 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 larger the shift in frequency of radiation received from the region near that macrobody. The frequency of light gradually shifts towards the red side of visual spectrum. Light appears exhausted during its travel and lowers its frequency due to the 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 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 radiation. If the distance traveled 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 range of transmission of photons. The phenomenon of red-shift 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').

Radiation of light from macrobodies beyond a certain distance does not reach us, on Earth. They would lose all their 3D matter-contents (so that constituent photons do not exist anymore) during their travel (presumably) from the regions of distant macrobody towards 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 an observer 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.

Resisted light:

As photons of a 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 affect their motions. External efforts may try to increase or reduce their linear speeds. Gravitational attraction between 3D matter-cores of photons, radiated away from the region of a very large macrobody (like a black hole), tends to resist linear motions of the photons. Attempts to reduce linear speeds of photons compel them to lose 3D matter-content and reduce their frequency.

CMBR:

If the distance traveled 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-contents during travel. At the instant of complete loss of 3D matter-content, all photons have minimum (and equal) 3D matter-contents, and they are supported by the smallest possible inertial-pockets. After the loss of 3D matter-contents by photons, they cease to exist as corpuscles of radiation anymore. However, they leave their minimal inertial-pockets as their residue in the universal medium. Inertial-pockets in any plane 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 the residual inertial-pockets, left by the dead photons in all directions, are equal towards any other point in space. Hence, electromagnetic waves, apparent from the residual 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 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 uniform, the presence of very large macrobodies (black holes) is not very uniform around any point. Moreover, radiation from these macrobodies produces a very high magnitude of resisted light that creates a higher quantity of background radiation from their direction. This radiation, although identical with that received from the tired light, added with others, may produce small fluctuations in the magnitudes of CMB radiation received from various directions.

Due to various other reasons, occasionally, photons of higher frequency also may 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 to mix with cosmic background radiation.

Conclusion:

The production and distribution of CMBR have definite mechanisms, not related to inflationary models of the universe. If the Big Bang and inflationary models of the origin of the universe are avoided, equating the magnitude of CMBR to the cosmic temperature/heat-level and the age of the universe has no meaning.

Reference:

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

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