

Cold Photons in Space & Hot Photons in Atmosphere: A Review

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Abstract— *Space is dark because the photons released from sun have lost energy and became cold photons during their passage towards earth. Because photons do not have energy in space, so space is cold. When photons reach atmosphere, it hits suspended particles and get annihilated. Thus these photons produce energy and light is seen. A definite quantum of energy must hit retina of eye to detect light which is absent in space. This article explains the phenomenon assuming dual nature of light. Retina can see the particular wavelengths of light ranging from 380nm to 780nm.*

Keywords— *photon, space, energy, wavelength.*

I. INTRODUCTION

Photons are released from sun have mass and definite quanta of energy. The energy associated with the photon is responsible for high speed. Gradually photon loses energy while it traverses through space towards earth. In spite of the temperature of the sun in excess of 1,000,000 Kelvin^[1] the outer space is dark and very cold. This is a perplexing question for which the explanations proposed, are not exactly satisfactory. This article ventures to explain this phenomenon assuming dual nature of light as follows.

While travelling from sun photons lose energy and become cold. A definite quantum of energy is essential to be visible and felt as warm. Retina can see the particular wavelengths of light ranging from 380nm to 780nm^[2-6]. So despite photons are present in sufficient amount in space, human eyes cannot detect it.

As photons enter atmospheres of earth, it hits the suspended particles present in atmosphere, explosion occurs and get annihilated. The presence of carbon particles and oxygen enhances the chance of explosion. The velocity of photons peaks up once more to moderate level. The energized photons as further moves, hit the larger and abundant suspended particles near the surface of earth. Here massive explosion results in higher energy of photons and wavelengths around ultra violet rays associated with photons emanate from photons. Gradually the energy is lost as it traverses through atmosphere. Ultra violet rays are abundant on surface of where carbon particles are plenty.

This questions the validity of ozone layer that filters out ultraviolet rays. Reduced carbon particles shall reduce ultraviolet load on earth surface.

II. DISCUSSION

Outer space is the expanse that exists beyond the Earth and between celestial bodies. Outer space is not completely empty, it is hardly a vacuum containing a low density of particles, predominantly a plasma of hydrogen and helium as well as electromagnetic radiation, magnetic fields, dust, and cosmic rays. The baseline temperature, as set by the background radiation from the Big Bang, is 2.7 Kelvin.. There is no definite altitude above the Earth's surface where outer space begins. However, the Karman line, at an altitude of 100 km above sea level^[7] is conventionally used as the start of outer space for aerospace records. It contains few hydrogen atoms per cubic meter. The air humans breathe, contains about 1025 molecules per cubic meter^[8,9]. A piece of bare metal in space, under constant sunlight can get hot. This is dangerous to astronauts who have to work outside the station. If they need to handle bare metal, they wrap it in special coatings or blankets to protect themselves. Astronauts can experience vast differences in temperature between the side facing the Sun, and the side in shadow.

This article explains above phenomenon as “photons liberated from sun, loses energy in its path. Photons, due to its higher energy liberated from sun have highest velocity in comparison to space, upper atmosphere and lower atmosphere of earth. In space the photon loses its energy and gains back in atmosphere. In upper atmosphere due to lesser suspended particle, energy content is medium, so also its velocity. But in lower atmosphere due to more of carbon particles and oxygen, photon gets annihilated and gains more energy. The velocity of light is 2nd highest in lower atmosphere of earth in comparison to other media.”

At daytime sky is blue because light from the nearby sun hits molecules in the Earth's atmosphere and scatters off in all directions. The blue color of the sky is a result of this scattering process. At night, when the part of earth is facing away from the sun, space looks black because there is no nearby bright source of light.

This paper proposes that "photons after losing all its energy becomes cold and makes the space dark and cold. On entering into atmosphere, it hits few suspended particles and gains energy. Human eye is sensitive to a range of wavelengths which carry a quantum of energy. 'But the cumulative energy liberated in upper atmosphere is of blue wavelength range. So sky appears blue. In morning lesser number of cold photons enter the atmosphere, so lesser amount of energy is liberated which is around red wavelength'."

We know from experience that the space is black. This paradox is known as Obler's paradox. It is a paradox because of the apparent contradiction between the expectations that the night sky be bright. Many different explanations have been put forward to resolve Obler's Paradox. The best solution at present is that the universe is not infinitely old; it is somewhere around 15 billion years old. That means one can only see objects as far away as the distance of light can travel in 15 billion years. The light from stars far away than that has not yet had time to reach us and can't contribute in making the sky bright.

Explanation proposed by this article is that "photons in space are devoid of energy. So these are not seen. Due to lack of particles in space, photons do not get annihilated. Hence photons are devoid of any energy. So the space is dark. If a photon have definite quantum of energy associated, then also it can be seen even there is no suspended particle in space. Space is cold because, the photon although having mass, does not have energy to keep the space warm. Entering into atmosphere of earth, photons hit particles and get energized. In morning and evening, lesser amount of photons hit particles, so the resultant energy is lesser and of red color range. At lower atmosphere, where suspended articles are there, more energy is being released, but never reaches a cumulative violet range, although violet and ultraviolet rays are emitted. Maximum ultraviolet rays are generated at most dense part of suspended and carbon particles."

"Photon after repeated annihilation, possibly losing its mass and subsequent chance of generating ultraviolet rays is reduced. So ultraviolet rays are maximum in middle of atmosphere."

III. CONCLUSION

Photon loses energy while it traverses through space towards earth. The paper provides an explanation on dual phenomena assuming photon having real mass and only energized photon is visualized by human retina. When photons reach atmosphere, it hit suspended particles and get annihilated producing energy and light is seen. The velocity of light is fastest near sun, slowest in space and gradually increases towards the surface of earth. A definite quantum of energy is essential to be visible and felt as warm.

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