The Matter of Light in the Universe

The nature of light

By convention, light has a dual personality – as electromagnetic waves – and as particles (photons). As Newtonian corpuscular light "Opticks"), photons must have mass, albeit almost infinitesimal. However, sound transmission occurs as waves of molecules. Light transmission might occur similarly as waves of photons. Even water waves, with which one compares electromagnetic waves, are made up of molecular "particles."

Two examples suggesting light photons might have mass are:

1) Light is bent towards a heavy mass (a star) as it passes near its maximum gravitational pull.
2) Light makes photometer vanes rotate. When a photon is reflected (ricochets) off a shiny surface only a portion of its momentum is transferred to the vane. However, on striking the dark side, it transfers all of its kinetic energy to the vane, causing the vane to gain more velocity from the dark side than from the shiny side. Tiny photons' momentum comes from extreme velocity.

Problematic for the corpuscular light theory is polarization. Polarization might be possible if each photon were oscillating in all planes about its center. Polarization might force the oscillations to be limited only to one plane, creating a discoid photon. When polarized photons oscillating in a discoid plane, are subjected to a polarizing filter perpendicular to its plane, the light beam would be blocked. (This would be like trying to put a disc-shaped steel plate vertically into a horizontal slot).

Dark matter is most concentrated near the brightest galaxies.

Stars emit massive amounts of light energy. Corpuscular light from every visible star must pass through every viewing point in space. Thus, space is replete with immense numbers of photons. By the inverse square law, the concentration of photons is greatest near its star source. The larger and brighter the star, the greater is this concentration of photons.

Dark matter is more concentrated near bright galaxies, leading to the paradoxical possibility that light is dark matter. Mass-bearing components of cosmic rays are already parts of the mass of the universe

Spatial relationships to light in the universe

If the universe were not expanding and the average light (excluding sunlight and moonlight) reaching Earth from all conical sectors of the sky is similar, then there would be no difference in the average light spectrum from each sector.

If the universe were expanding evenly in all directions, one would see an evenly distributed measureable red shift in the spectrum that must increase as the stars' distances from Earth increases.

If the universe is expanding away from the point of a Big Bang (BB), then on a line through Earth to the BB, there would be an increasing frequency of the light coming towards Earth from the BB, associated with an increasing blue shift. On the line extending into space away from Earth and the BB there would a lower frequency (red shift). In addition, by the inverse square law, there would be an exponentially higher concentration of stars and light on the line to the BB, compared to the concentration of stars and starlight on the line away from Earth and the BB. The night sky would be obviously brighter towards the BB.

Finally, dark matter may selectively absorb more blue light than red.