

CHALLENGING THE BIG BANG THEORY

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April 19, 2018

Edwin P. Hubble and Milton L. Humason formulated, in 1929, the Hubble Law whereby a redshift occurring of more distant starlight is a constant, now known as the Hubble Constant. Two explanations of it were given. One explanation is according to the Doppler Effect whereby a redshift occurs of a recession between the observer and the light source. Because it is assumed the redshift increases with distance, it is theorized the universe is finite and expanding. By the other explanation, as was proposed by Nobelist Fritz Zwicky at the time, light loses energy as it propagates through space. It is known as Tired Light.

Tired Light was discarded in favor of the expanding universe, now known as Big Bang, because observational data at the time was believed to be more consistent with a Tolman Brightness Test. Accordingly, because starlight takes time to reach the observer, the light source and its distance is of the past, when it was closer, such that it should appear bigger and brighter than from where it is now. To the contrary, according to Tired Light, the light sources are, on the average, the same as where they emitted light. However, if loss of energy is in proportion to light energy, as measured according to frequency, then the calculation of distance also differs. For distance to be calculated the same for redshift and brightness, the intensity of light for distance-squared must decrease the same as redshift, which would occur if the medium of space through which light propagates absorbs a constant amount of energy, as per speed instead of per energy.

In the 1990s, the data began to indicate the redshift distance of starlight is more the same as its brightness distance. Also, in 2009, Eric J. Lerner of the Lawrenceville Plasma Physics Inc., USA, published an article titled Preliminary Results Challenge the Expanding Universe Model. The result has been a modification of

Big Bang whereby the universe is now assumed to be expanding at a faster rate than in the past. To explain how this increased rate of the Hubble Constant is possible, its cause is further assumed to somehow be that of the existence of “dark energy”. The universe is further assumed to be about ninety percent dark energy and about five to six times more “dark matter” than regular matter.

Why the universe is now assumed to be expanding at a faster rate is because the Hubble Constant more towards the edge of the universe, by interpretation of the data, is less than as determined of stars within and closer to our Milky Way galaxy, as according to brightness distance. This observation turns out to be consistent with Tired Light with no need of modification if the change in redshift of light energy is constant with distance.

There is further issue regarding dark matter. As early as 1939 Horace Babcock noted a discrepancy in the rotational speed of the Andromeda galaxy. In the 1970s and 1980s, a general study of the galaxies under the guidance of Vera Rubin indicated that rotational speeds of stars in spiral galaxies, including our Milky Way, do not appear to decrease according to Newton’s inverse-square-law. The rotational speeds are constant with distance instead of decreasing with distance. To explain this apparent violation of law, dark matter is assumed to exist within galaxies. It differs from ordinary matter in that it neither emits nor reflects electromagnetic energy, as for it to be invisible except for gravitational effect.

The assumption of dark matter has been challenged. Mordehai Milgrom proposed a modification of Newton’s inverse-square-law of gravity in 1983, referred to as MOND. In 2004, a relativistic version of the modification according to space-time curvature was offered by Jacob Bernstein. In 2008, the book *Reinventing Gravity* by John W. Moffat was published, referring to the modification of gravity, as MOG, whereby the gravitational constant relatively increases away from the center of mass due to greater decreases in repulsive force away from the center of mass.

A variable constant of gravity is an alternative to assuming the existence of dark matter, but neither dark matter nor modification of theory is needed in view of Tired Light. The dust clouds and gases within the spiral arms of galaxies forming new stars could indicate the presence of unobserved-ordinary-matter.

By present gravitational theory, an orbital speed of the planet around the sun decreases for greater radial distance. However, the surface of a large spherical mass increases to that of its inner

mass. There is greater orbital speed for greater mass. Consider, then, the mass density stretches outward towards becoming a disk instead of a sphere, whereby rotational speed nearer to the center is slower. Somewhere in between the two extremes of a sphere and a disk is a constant orbital speed of radial distance.

Further consider how cosmic mass is observed according to visible radiation. Of particular relevance is that eighty percent of the mass in the universe is believed to be hydrogen. Cold hydrogen is relevant in that its presence is extremely difficult to determine. An electron can either rotate in the same direction as does the proton of the nucleus or in the opposite direction. Its change in direction from parallel to anti-parallel whereby low energy light is detected as typical of the Cosmic Microwave Background Radiation that has no evidence of its direction of origin. It could thus be the missing mass, as ordinary mass, in the spiral galaxies that is part of the creation of new stars.

Another reason given for the dismissal of Tired Light has been the observed clarity of the distant stars. It is argued the medium of space absorbing light energy should alter the visibility of the source. Counter arguments have been made and dismissed. One dismissal of an argument by another Nobelist, Albert Einstein, was part of a pilot wave theory in view of Maxwell's theory of electromagnetism in that photons are the guidance of a packet of waves. It relates to a particle-wave-duality explanation as proposed by Louis de Broglie and other physicists.

Maxwell explained the process of electromagnetic propagation as conditional to space alone, as not a part of any physical medium, but observational clarity is also evident of electromagnetic energy passing through the atmosphere and cables, as for television. For explanation, it is here given according to a right-hand-rule.

The right-hand-rule explains why two parallel wires, as Ampere discovered, contract if electric currents flowing through the cables are in the same direction, whereas they repel if the currents flow in opposite directions. It is according to the polarization of magnetism wherefore induction of electricity occurs. Magnets are bipolarized where from like-poles repel and opposite poles attract. If a magnet is divided into two or more parts, each part is still of opposite poles. A change in magnetic strength induces an electric current flowing in a wire. If the flow of current is circular, it induces a magnetic field. Electromagnetic waves are a continuation of electromagnetic fields,

In short, the flow of current and the electric and magnetic fields are all perpendicular to each other in manner of the directions in which the hand and thumb point and the fingers curl. The opposite poles of magnetic effect from currents flowing in the same direction thus align closer to each other to attract, whereas like poles align by the currents flowing in the opposite directions for them to repel.

Significantly, individual arrangements of bar magnets do not change as long as their medium of propagation is in balance, even though the energy for propagation either increases or decreases. As has been here previously noted, Maxwell explained the process of electromagnetic propagation as conditional to space alone, as not a part of any physical medium. Starlight being electromagnetic waves of energy can thus exist as bar-magnet-packets maintaining individual images while losing energy as they interact with a virtual field of energy from which they propagate as wave action through space.

Tired Light is not only explainable in a manner consistent with existing theory; it also provides a means of explaining gravity itself as a long-range-recycling-vacuum-effect. The minute loss of energy per distance of propagation provides a long-range effect from the vacuum effect in the wake of emitted radiation whereby long-range-actions are considerably less than such other energies of the atom as electricity and the strong nuclear forces. For instance, light-energy lost at a distance equal to the diameter of the hydrogen atom, as per light speed, equates to the ratio of gravitational to electrostatic energy of the hydrogen atom.

All of this and much more is explained step-by-step in historical and simple mathematical detail in my book **EXPLAINING GRAVITY AND HUBBLE COSMOLOGY**. It is now in the publication process to soon be available for purchase.