

The Hidden Laws in the Universe

The visible universe of space and matter has underlying laws that cause the creation of fundamental matter, their assembly, continuing stability and regulated movement. The laws that follow from the principles of Space Vortex Theory (SVT) are as follows:

Law 1

The universe has only one primordial entity “space”(Absolute Vacuum), that structures matter.

Law 2

Matter is constituted with multiples of only one kind of fundamental particles (electron / positron).

Law 3

The field distribution in space, as recognized by contemporary physics, linked with and emanating from matter, are effects arising from only one fundamental field in space.

Law 4

There is no void in space any where in the whole universe except at the centers of the fundamental particles of matter (electron / positron).

Law 5

From only one fundamental universal constant all the constants, considered universal in contemporary physics, are derivable.

Law 6

The spatial structure of sub-microcosmic fundamental matter is repetitive uniformly in the spatial structures of macrocosmic bodies like planets, stars and galaxies.

Mass is an effect-- a property of the electron structure. There is no fundamental particle of mass, other than the electron.

Space Medium

For a lay man, space is a volume of three dimensions: length, breadth and height, filled with life sustaining air. A space-volume devoid of air has been termed in physics: “absolute vacuum”, an “emptiness” as per Newton, but filled with a property less fluid (ether), unlike matter that we know of, as per Rene Descartes – referred as the great French philosopher and mathematician. Light is transmitted through this fluid like wave propagation as per the Cartesian philosophy while as per the Newtonian, corpuscles of light move in empty space. Apart from our understanding of the real nature of light produced at a light source, there is a need for exploration of the real nature of space too in which light effects are transmitted and material bodies move. Is space a real entity that transmits light wave or is it a complete void in which light corpuscles are projected from the source, has been debated over centuries. Also, is space structurally related with matter or space and matter have independent existence?

A Sensible Approach

On the nature of space, a distinct progress in our understanding of its properties came through the discovery of electrostatic and magnetic fields. The experiments of Faraday and others led to the fact that these fields produce forces (aspects of energy) between charged and magnetized bodies and their effects are *continuously* varying in space. The immediate conclusion from this observation is that space medium that can sustain fields must be continuous and a real entity. It was therefore being theorized in the later part of the 19th century that space, as an ethereal fluid medium, during motion, circulation, acceleration etc. produces field effects. The very source of electrostatic and magnetic fields was discovered by the close of the 19th century when electron with the least electric charge and least mass was discovered. Efforts were made to understand electron structure and its properties through models of fluid ether and its vortex effects, such that the origin of electric charge, mass and the field effects could be traced.

The Turning point

There came a turning point at the start of the 20th century when in Special Theory of Relativity (STR), Einstein postulated an empty space (certainly, conceiving space to be a void extension) with no velocity vector assigned to any point of space. The ongoing researches on the electron structure, origin

of electric charge and fields, suffered a setback in the absence of the then accepted fluidity and reality of space since in due course STR, though digressing drastically from the ongoing researches, was acclaimed to be the final theory on the nature of time and also giving a deeper meaning to simultaneity. (However, the derivation of the mass energy equation done in STR too, was a milestone.) Had electron structure been discovered prior to STR, further theories to gain deeper insights on the nature of mass and charge that remain unexplained in depth today, would have followed in natural course of physical researches.

Some new problems arose on the nature of light if it is not a wave like effect in the absence of ether: what is the structure of a light-corpuscle? What force propels it to move at a constant speed at which it moves relative to a source in the absence of any spatial-medium? An oscillating atom will produce light was a known effect but atoms themselves were then being modeled as ether vortices. In the absence of ether could there be ether vortices that will vibrate and produce light? How could one conceive of a "ray of light" as used in STR if the very source, the vibrating atoms are non-existent in a void-space of STR? To compound the problems further, a four dimensional, space-time and empty space of relativity led to a highly complex concept of space that could not be conceived without a physical picture till then adhered to in most of the scientific analysis.

The results of Michelson-Morley experiment, generally accepted as a negation of ether's existence, had a presupposition: that velocity of ether relative to a light source can have vector addition with the velocity of light transmitting in it. A swimmer's velocity can have vector addition with the velocity of a flowing stream because both are structurally independent and can interact with each other. But where is the proof, even today, to conclude positively that space, if not a void, is structurally independent of light effect transmitting in it? To clarify this point let us take an example: Suppose a small metallic shell is immersed within a large volume of a fluid, say, water. Now evacuate the shell which will cause the surrounding water to exert inward pressure on the shell. This pressure will exist in the whole volume of the water body, varying in inverse square ratio with the distance from the center of the shell. Suppose the center of the shell coincides with the origin of a set of axes X, Y, Z, in which X axis is horizontal. If the shell displaces slightly along X-positive, a point p at X and in the neighborhood

of the shell will experience higher pressure. If the shell displaces along X- negative p will experience lower pressure. If the shell oscillates p will experience wave-pulses of higher/lower pressures and this effect, initiated from the shell, will be transmitted throughout the body of water at certain wavelength, frequency and velocity relative to the water body and also relative to the shell. In case of any relative motion between the shell and the water body the wavelength of the wave (pressure/under pressure effects) may change but not the velocity of its transmission. This is because for a wave motion, by definition, if wavelength reduces, frequency being the nos. of wavelets per second, increases proportionately, thus keeping the product of the frequency and the wavelength constant. The above system of wave is very similar to the sound wave composed of compressed/rarified zones produced by a sound source. Now, if the shell is moved relative to the water, the pressure field structure around the shell will also be shifting and carried with the shell. In this respect, the pressure field can be considered to have structural relation with the shell. Further, a uniform motion of the water body relative to the shell will not distort the pressure-field pattern. It will be shown later that oscillating atoms producing light in thermal radiation have similar structural relationship with the light produced.

From the nature of light as per SVT , discussed later, it follows that in Michelson-Morley experiment ether drift, if any, can not interact with the light beam to deflect it. If the experiment showed null result, all it means that there is no relative motion between the spatial ether and the source of light.

Some other serious criticisms against ether were due to following: The speed of any mechanical wave v in a medium is determined by its inertial as well as elastic properties: $v = (\text{elasticity} / \text{density})^{1/2}$ and in ether for v to be equal to light speed, even for very low density, elasticity required will equal that of steel! Low density and high elasticity for the same substance are contradictory properties. Further, experiments with smoke rings simulating ether vortices showed dilation of rings and thus the stability of ether vortices were believed to be impossible.

Nature's requirement for space properties seemed to be strange, far different from any kind of matter with mass, density, elasticity, compressibility etc.

Introducing New Concepts

Universal Space

Defining “energy”, as commonly understood today (in scientific terms) to be the generally accepted name for “reality”, it is stated that the only reality in the universe is primarily inherent in the medium of space –a three dimensional volume of a **nonmaterial** fluid entity, enormously large (a sphere, not less than 3.3×10^{31} cm radius) and eternally existent within an infinite extension of nothingness (Fig. 1). This entity, hereafter termed as “space” in current classical terminology, is defined as: “Absolute vacuum without matter and fields”.

The universal space, in the part of the universe we exist or anywhere else within its bounds (Fig. 1), is the absolute vacuum pervaded with matter and fields. Therefore, space or absolute vacuum without matter and fields is an ideal state that would have existed prior to the creation of universal matter.

The ideal state of space in itself is either static or dynamic. The static state exists prior to creation of matter, whereas the dynamic state is itself the primordial energy that creates matter. [The cause and the process through which the static universal space became dynamic at some instant are beyond scientific explanations and are likely to remain so unless spiritual principles that transcend science philosophy are invoked.] In fact **matter, structurally, is a dynamic state of space.**

The universal space possesses unchangeable absolute properties: mobility and all the known nonmaterial properties like mass-less-ness, non-viscosity, zero-rigidity, continuity, homogeneousness, incompressibility etc.

The universal space in dynamic state is inherent with circulating motion. The mobility of space has limits: During circulation around a point, space-flow breaks down at a limiting velocity gradient –the ratio of limiting velocity of flow and minimum possible radius of circulation. The postulate is:

The universal reality is the dynamic nonmaterial space that breaks down in its flow at a limiting velocity gradient.

Universal Matter

Newton's concept of the universe was not very different from Democritus' who believed the universe to consist of "atoms and Void". The Rutherford's atom of early 20th century with a central nucleus and orbital electrons gives a deeper insight of the structure of matter. Despite the fact that electron was found to be a stable particle with least charge and mass, existent in atomic structure and also in electric current, yet it has not been finally identified as the fundamental particle, rather it is believed to have composition with quarks –a conclusion borne out of high energy collisions of particles. Researches in physics continue to search for a fundamental particle and a fundamental field while the primary causes for the properties exhibited by the known particles, like mass, inertia, charge of electron remain yet to be found.

Difficulties in Physical Picture

Maxwell's conclusion that accelerating electric current gives off energy as electromagnetic wave led to the belief that orbital electrons, accelerating in their orbits in atoms, must lose energy and fall on to the nucleus. With space taken as a void and atoms somehow created and existing in it, even as per the prevalent concepts, the region between a nucleus and orbital electrons is also believed to be a void and hence it is but natural to reach the above conclusion that orbital electrons may fall on to their nuclei. How is energy "given off" from an accelerating electron could not be physically conceived because neither the structure of electron was developed nor the nature of energy was known. As per the Bohr atom the forces acting on the orbital electron moving around in atomic orbit taken into consideration are electrostatic attraction between the electron and the nucleus and the centrifugal force on the electron. The orbital electrons are restricted to move in fixed orbits and in excited condition of an atom jump from one orbit to the other to emit light. Later, it came out that electrons can not be considered moving in their orbits but rather moving around in a hazy way with certain probability of being found at a certain place.

But before that, the Planck energy equation was formulated which as interpreted by Einstein: light energy is not only emitted from a light source in definite quanta of energy but also retains this quanta during its transmission as a packet of energy. Through his explanation of

photoelectric effect energy was conceived to be discrete, photon concept of light was introduced and quantum physics was founded on the Plank energy equation: $E = hf$.

As per Plank energy equation the quanta hf is energy emitted in unit time and requires some storing mechanism so that the energy proportional to h in each wave pulse is accumulated over unit time from f nos. of wavelets; this strange process continues to be a serious flaw to be addressed also in a physical sense rather than through mathematical solution.

Consider an oscillating atom, A , producing spherical pulses of light transmitted out in space with absolute properties as postulated above. In unit time as per $E = hf$, f nos. of shells will be formed in succession around A and transmitted out. It can be assumed that each shell has a fixed amount of energy and with f nos. of successive shells in unit time, each shell is distinct with its neighbor and transmitting at speed c relative to space due to the very property of space. With such a nature of light it can be seen that light energy has discreteness, spherically. In this case the centers of each shell remain fixed with the center of A . Another picture is that f nos. of photons (particle like) emitted by A in unit time making the light corpuscular. Here, the centers of photons are traveling with respect to A at light speed in a void and keep their speed constant throughout for reasons unknown, for unlike a wave motion in space, a void-space plays no part in determining the velocity of the photons with respect to the source. Also, what is it in the structure of atoms that projects photons at speed c and not at any other speed? How do we picture and define frequency of a single photon other than that it wobbles transverse to its motion in empty space? If energy of a photon is hf , it means it can be emitted from A only once in a unit time when energy of f nos. of sub-quanta are summated within the structure of A . In the absence of a physical picture unresolved complexities exist on the very possible existence of photon nature of light.

Experiments showed that an electron beam passing through a slit showed diffraction pattern like what a light beam will show. This led to wave particle duality. And if particles behave as wave, a wave should behave as a particle was Louis de Broglie's suggestion. In short, till then the prevailing concept that a wave and a particle are physically distinct entities got merged into wave-particle duality while earlier mass energy relation had introduced mass energy equivalence even in a physical sense. On electron

diffraction if space is supposed to be a mass less fluid, as postulated earlier, rather than a void, we can expect that interaction of a beam of electrons moving at high speed relative to fluid space will be diffracted and their distribution pattern in space will be very much the same as that of light waves diffracted in fluid ether. Thus, to postulate that electron must behave like a wave as well might not have been a forced issue. Also, since atoms were being postulated to be ether vortices, the region between the orbital electrons and the nucleus will not be a void. The orbital electrons will be carried along the circular/elliptical stream lines of the vortex and prevented from falling on to their nuclei. In that case quantum physics would have taken a different turn.

A solution to the above complexities that hinder understanding of physics of matter lies in drastic revision to our modern concept of matter and energy.

Matter –a New Concept

The universal matter composed of nuclei, atoms, molecules, are assemblies of many fundamental particles of matter, the fundamental particle being electron (SVT). The electron is a space vortex in which limiting velocity gradient has been reached, breaking down the space-flow into a dynamically stable spherical void at the vortex center. The void is a volume of nothingness, without fields and energy in which space itself, as a substance, does not exist (Fig. 2).

The nature of void at electron center is the same as the infinite extension of nothingness within which the universe or the universes float (Fig. 1).

Presently, matter in general has been observed to be a composite assembly of basic nuclear particles and atoms, and taking a clue under this trend of philosophy one may postulate that even an electron has more basic particles in its structure. ***But this procedure of building particles from more basic ones finally ends in electron structure as shown in SVT.***

Electron center has a dynamically stable volume of a spherical void within which space is nonexistent (Fig. 2). With this structure of electron, from one continuous space medium, another medium of sub-micro sized spherical-void which structures matter is created, thus bringing into existence two basic universal media, namely space and matter.

Explaining mass and other properties of Matter

Discontinuity is a basic property of matter arising due to electrons composing all matter and having their independent central voids. Mass and charge of electron are the most fundamental properties of matter starting with the least possible stable mass and the least possible stable charge of electron. As given in Appendix 1, electron mass is proportional to the product of the central void-volume and maximum space circulation speed c . Electron charge is proportional to the product of the central interface enclosing the void and maximum space circulation speed c . These two basic equations are applicable universally for all micro as well as macro cosmic bodies. (In Appendix 6, mass of the sun and the galactic core have been derived from the mass-equation. Also, solar charge is derived from the charge-equation).

On account of the proportionality of mass and charge of electron on the volume and the surface of its central spherical interface, fractional mass or fractional charge are not possible since there can not be fractions to a sphere that can be stable.

Discovery of New Fields

In contemporary physics, fields are accepted as the most basic entities in the universe, not reducible to anything more fundamental. If that be the case, a question arises on the process of creation of the known fields and the basic entity, if any, that structures them, for which there are no plausible answers. The solution to this impasse lies in the following:

A new fundamental field, “velocity field”, meaning “velocity of space-points within a volume of space in uniform or circulating motion” has been introduced in Space Vortex Theory (SVT). In mass and charge equations velocity field (VF) has the limiting value c . Starting with velocity field, acceleration field (AF) meaning acceleration of space points is derived below from the electron vortex structure:

In a plane irrotational space vortex, the tangential velocity of a space point varies inversely as its radial distance from the vortex center (Fig. 3). In electron structure, the central void is subjected to an inward acceleration field, c^2 / r_e , produced due to circulation of space at limiting speed, c , around the least possible limiting radius r_e . This is the highest possible “inward acceleration field” in the whole universe because c is the limiting

velocity of space - motion and also the speed of transmission of all field-effects relative to space; and r_e is the least possible radius of electron's central void. This follows from the postulate that the limiting velocity gradient in space, that creates electron, is c / r_e , symbolized ω .

Electrical Attraction

Appendix shows two electrons with their velocity fields in opposite directions. The one with anticlockwise rotation is termed "positron". In between the particles, the velocity fields are in the same direction; this causes electrostatic attraction. Whereas, between two electrons located side by side, velocity fields will be opposite, causing electrostatic repulsion. The Coulomb's equation and electrostatic field derived show that Coulomb's constant is directly proportional to the limiting velocity field c . Dielectric constant and permeability constants are also shown to be proportional to c . In the derivation of angular momentum and magnetic moment of electron also limiting velocity field c and the radius¹ of electron appear.
