

Exploration

Metaphysical Analysis of Space, Energy & Time Based on Modern Science

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Abstract

The applications of three fundamental quantities space, energy and time of universe, their causes and effects and interdependence are metaphysically examined on the basis of vedic and modern sciences. The analyses based on modern science are presented in this paper whereas the analyses based on vedic literature are presented in the previous paper.

Keywords: God, vedic literature, space, mass, energy, time, critical value, explosion, em waves.

I) Introduction

The Metaphysics is a branch of Philosophy which deals about science, society and interrelation between the science and society. All research activities and innovations in science or in any field are directly or indirectly related to the welfare and developmental activities of a society. Man, the most intellectual living entity would like to explore the existence of God, His potential and His creations. It has been a major thrust area in materialism and spiritualism for many centuries and it would continue to be the important field for saints, philosophers and scientists in the world.

The universe is composed of space and energy and moves with time. There is no activity or action which does not have effects of space, energy and time. The three fundamental universal parameters are independent, but they are interrelated in a very complex form from atomic to universal level. The three media - space, energy & time are waved together. Each has its own properties and behaviour, but one cannot exist without the others. Theoretically, each of them has neither beginning nor end, and they are all one entity. Nevertheless, they are changeable, depending on different phases of energetic matter in which they appear and decay together.

The astrophysics and space research activities are to explore the other planets and galaxies to understand the creation of universe and planets; and possibility of human life in other planets. The Indian and Western philosophers scholars believe in Indian scriptures and strongly admit that universe and motion of planets, living and nonliving things are created by the super natural powers and it is under the control of Supreme Lord.

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The western philosophers and scientists Aristotle, Neil's Bohr, Heisenberg, Schrodinger, Einstein and many more endorse Vedic literature^{1,2,3} and high admiration about the classical and marvelous temples built in India and abroad based on vedic science without any scientific technology developed during that ancient period, and they strongly agree that one can obtain new ideas, thoughts and concepts from Indian scriptures. In this context we can understand the importance and realization of vedic science given by Jun John Sakurai, physicist in his Quantum mechanics theory that he used the names of triad deities as three operators named after Creator (Bramha), Protector (Vishnu) and Destroyer (Shiva).

The modern scientists are trying to explain the creation of the universe through Big-Bang, dark energy, black holes and gravitational waves theory with the help of general theories -Theory of Relativity by Albert Einstein, Planck's Quantum theory of Max Planck and Electromagnetic theory of Maxwell developed in Physics during the 20th century. The scientific information can be correlated with vedic science.

In this paper an attempt is made to study the metaphysical analysis and applications of space, energy and time and their effects with reference to living entities. They are categorized into two different approaches based on Vedic literature and modern science. The analysis based on vedic literature is presented in another paper¹⁷ whereas the applications based on modern science is illustrated in this paper. The meticulous analysis cited in both papers may initiate research scholars and scientists to explore further in unknown areas of space, energy and time.

II) Metaphysical Analysis

Some of the applications of space , energy and time which are analyzed metaphysically using mathematical expressions used in physics are presented in this section.

1) Space

The entire universe/space around us is called Milky Way Galaxy (Akash Ganga). The matter moves with time in the form of energy in the space. The event once occurs moves in space and time. Albert Einstein introduced the concept of time as the fourth dimension in space coordinates called space time. The events which occur at a particular time and particular position in space are identified in a classical relativistic physics as space time coordinates as (x, y, z, t) or in dimensions of distance as (r, ct) in four dimensional system, where c is the velocity of light. These notions headed towards in formulating Lorenz transformation⁵, the time dilation, length contraction and mass and energy relations in theory of relativity.

The space time is independent of any observer. The trajectories or history of space time events are expressed as world line, i.e. path of an object or traces of the history of particle. When such events move with energy content, the space time is curved by the presence of matter (energy) are

generally explained world sheet (called string) and world volume (termed as brain) as movement of flux or energy in the space⁶. The scientists have simplified theory in uniform way to understand the physics both from the super galactic to subatomic particles. As per the present theories, the universe is best explained in terms of Fermionic fields as matter and Bosonic fields as energy.

2) Energy & Sound vibration around Sun – Om:

Every matter whether it is static or dynamic possess energy. It starts vibrating when body possess energy. Ever since the matter is born, and every instant it is moving, causes the movement in the space emitting energy in the form of electromagnetic waves in space with time.

The universe is completely filled with energy and vibrates with its natural frequency as Om. It was realized and manifested in Vedas by Indian saints and scholars thousands of years ago.¹⁷ As per the reports available in You tube (Fig.1), NASA recorded the sound vibrations of energy around the Sun's atmosphere as **Om** which is sacred nad divine word for Hindus described in vedas^{1,2}. One can watch short video clips using the below websites links in you tube.^{15,17}

<https://www.youtube.com/watch?v=hFdWxnPCvSs>

<https://www.youtube.com/watch?v=DYk7s73dgog>

3) Time

As per the Vedic scriptures it is believed that Lord Brahma created the universe with energy vibrations as Om on a particular day termed as Uagdi (presented in detail in my previous paper)¹⁷. The Ugadi is a festival of time. Time is so important a factor that it determines good and bad periods of life and it is studied by the science of Astrology. The whole physical world cannot be described without the time parameter. Time is an indefinite quantity which continuously progresses from the time of occurring the events and movement of matter and energy in the Universe. It is described as fourth dimension in space time. Time has three components past, present and future^{11,17}. All expansion and compression processes and rate of reactions, movement of mass and energy in the space are time dependent functions.



Fig.1: Sound vibrations of energy around Sun.

4) Units and dimensions

The length (L), mass (M) and time (T) are three basic quantities out of seven fundamental quantities. All other physical quantities are derived and expressed as powers of L, M and T.

5) Explosion and Peace

The explosion and breakdown occur in any system when the internal energies are more than the certain critical value. As per the kinetic theory of gases the pressure (P) exerted by the gas depends on density (ρ) of gas and rms velocity (C_{rms}) of molecules of the system is given by

$$P = \frac{1}{3} \rho C_{rms}^2 = \frac{2}{3} (E)$$

$$\frac{dp}{dt} = \frac{2}{3} \left(\frac{dE}{dt} \right) = R \left(\frac{dT}{dt} \right)$$

where $E = \frac{1}{2} \rho C_{rms}^2 = \frac{3}{2} RT$ energy density.

When the rate of change of pressure exceeds the critical value $\frac{2}{3} \left(\frac{dE}{dt} \right)$ the explosion takes place or in other words when inside pressure is more than outside pressure. The pressure variation depends on rate of change of energy or rate of change of temperature.

The bursting of tires and balloons which are adiabatic process use the same principles. It is the same condition applicable to all mechanical, human body systems or society such as explosion, internal fights or quarreling between the two rival parties. The energy will be suddenly released from one who is undergoing in high stress and tensions such as players in the field at the time of winning or losing the games. He who is completely depressed, suffering with sorrows, facing many problems, tensions either in the family or office matters said to be stressed. When the internal energy exceeds certain critical value, he may suddenly upset or may go to abnormal state and sometimes may it lead to suicide.

The specifications such as ratings, limiting values are clearly mentioned on mechanical instruments. In case of strength of material as per the Hooke's law, the stress versus strain graph shows the materials get deformed and cannot be restored to original form if it exceeds break down point. The ratings are clearly mentioned on the electronic instruments in terms of the voltages and currents such as 30V, 110 V, 220 V, 10 A.

The production of heat can be interpreted using well known thermodynamic and electrical circuit relations

$$\frac{dQ}{dt} = ms \frac{dT}{dt} = \frac{i^2 R}{J}$$

If the current is more or if it is passed longer time through in electronic gadgets , the temperature of the system increases, the molecules get heated and increases the internal energy due to the translational, vibrational and rotational motion of the molecules. If it crosses the critical value, then explosion and quarrel take place . It is the same concept which is applicable to all systems such as instruments, two rival groups and in all living creatures.

The peace and harmony in any system or any organization can be restored and maintained if internal energies are less than certain critical value, the attractive forces and relations between the two parties are amicable, otherwise bursting or explosion occurs at any time. In order to avoid the abnormal behaviors, we generally incorporate, thermistors, high thermal conductivity, high specific capacity and high melting point materials. In this context we can say the human body and mind should be physically, mentally, financially and spiritually energetic to bear such breakdown anomalies in human life. These are basic management skills to run a family and any organization.

6) Accrual of wealth

The accumulation of wealth (i.e. energy) depends on features and properties of work or business similar to the characteristics of coefficients such as specific heat capacity, thermal conductivity and Young's modulus etc., of thermal and mechanical properties of materials. If one goes on accumulating the huge amount of wealth-movable and immovable properties gold, jewelries, lands, palaces money etc. illegally at different places (space); the wealth and energy would be questioned and collapsed in a short time if it crosses the certain critical value or break down point. It is similar to the demonetization effect in India in 2016.

7) Inflammable

Any injury to the body at any place causes response to the increase in number of cells and blood supply in order to counter the injurious factors. This liberation of heat energy and localized swelling takes place with the passage of time until the harmful factors are subsidized.

8) Detachable and Adoptable

The Photoelectric effect phenomenon says if the frequency of incident (f_i) radiations is more than the threshold frequency (f_o), the photo electrons are emitted from the metal. In other words the incident energy should be more than the work function of the emitting material so that photo electrons are emitted and sent out with high kinetic energy. ($E_i = E_o + \frac{1}{2} m v^2$).

This scientific theory is related to human psychology. In order to remove any object from space or substance, to terminate and rusticate someone from the organization, the authorities should

possess more energy than the defaulter. One can also apply this theory to eliminate bad practices in life or adapt decent culture, etiquettes, to be humble and in path of spiritual activities, one should have determination and high energy for adoption of new system.

9) Work and Energy

As we know the work and the energy are interrelated and become complex once time is involved. The gain of energy in any system is proportional to the time. The energy could be in any form such as mechanical, heat, electrical, chemical and nuclear. The mathematical expressions are well established in Physics are mentioned few here as $W = J H$, $Q = msT$, $H = \frac{i^2 R t}{J}$, which depend specific heat (s) of the body, temperature (T), current (i), resistance (R) and time of operation(t). The rate of doing work or energy is defined as power ($P = \frac{W}{t}$).

a) Energy Gain & Achievements

The metaphor of above equation is shorter the time, higher the power in completing the work. In order to enhance power one has to spend huge amount of energy or money to save precious time. The remaining time can be utilized for doing additional tasks. The time is saved at the cost of spending high energy and money. Hence one whose possesses surplus energy or money, he can save the time otherwise he will waste precious time. The rich people spend extra money in travelling as well as professionals who have skills and techniques complete the work in short duration to save the valuable time of their life. The life span of living entities is very short in this materialistic world of Kaliyuga. If one who is not successful in his profession, he can shift to another field, so that he can excel and can have name and fame as well as wealth and energy if one use the precious time properly. Hence we say “*Time is money*” and “*People talk of killing time, but time kills their energy and life*”.

In this materialistic world one who takes birth, would like to live longer time on this earth. To survive more time he would spend his entire energy (money) in maintaining his body in good health. Every living entity has particular life span on this earth. In a given stipulated time one would like to complete all materialistic and spiritualistic works such as his career, family development, domestic as well as office works. *If the skills and energies are meticulously and effectively used and prioritizing tasks one may be able to solve them satisfactorily.*

b) Energy Loss:

If two systems have different temperatures, the hot body loses energy as time progress as per the Newton’s law of cooling

$$\frac{dQ}{dt} = - (T - T_o)$$

It implies that a knowledgeable or resourceful person if he stays in his companion group of his status, he may gain knowledge as well as energy which can be easily accessible; otherwise if the temperature difference or energy gap is more and then stays for longer period in such a disparity system, his knowledge gets dissipated and becomes clod body, finally loses his identity.

c) Weight Loss

In fact every substance losses mass as time passes. The degree of loss may be different for different materials and depends on the type of activity. Some substances lose due to the rusting and chemical reactions. In case of the radioactive substances the mass and number of atoms varies exponentially $N = N_0 e^{-\lambda t}$ where λ is a decay constant of material. Some may take more time and some may take less time to disappear. The half-life period of radioactive material is given as $T = \frac{0.693}{\lambda}$.

In case of living entities, especially human body gains weight up to fifty years of age , and then he loses. In case of cancer patients, he may lose weight if the disease continues for longer period. The cancer cells expand at any rate depending on the stage or level of cancer and overcome the normal cells . If one knows the decay parameter which is the function of many factors such age, food habits, exercise and daily activities etc., one can estimate the period of his survival.

10) Matter and Waves

Matter has dual nature - wave nature and particle nature depending on the velocity of particle. The momentum ($P = mv$) and wavelength λ associated with wave given by the De Brogile is $\lambda = \frac{h}{p}$. The mass can be transformed into waves and vice-verse depending on the situations.

a) EM waves

The electromagnetic waves, which are transverse in nature, are space, energy and time dependent waves. They contain electric and magnetic fields perpendicular to each other and travel with velocity of light c . It is represented by $E = E_0 \sin (Kx - \omega t)$. As the wave propagates in the energy (E) gets transformed one point to another in the space (x) during the time t.

b) Sound waves

The sound waves are longitudinal waves. The energy of sound waves, propagate in the space up to the audience in a given time. This can be explained in simple harmonic wave equation as $y = A \sin(kx - \omega t)$, where y is the displacement, A amplitude, k wave number, ω the angular displacement, x spatial coordinates and t time.

11) Mass and Energy transformation

The matter can be in a state of rest or motion. If it is rest, it possess potential energy and occupy certain space for given time. If it is motion it possess kinetic energy and moves in the space for certain time. Thus the energy gets converted from one form to another.

Einstein relation

As per Einstein's Mass-Energy relation $E = m c^2$, the mass is converted into energy and vice versa. In atomic physics, the total mass of the constituent particles is less than the actual of mass of nucleus of an atom. The difference in mass is called mass defect (Δm). In nuclear reactions, the difference in mass is released as energy in the form of γ rays. When two atom bombs were dropped in Japan huge amount of energy was released in the space and nearly 10 km^2 area was destroyed.



Fig.2: Candle is burning - Conversion of mass into energy.

The best example to demonstrate the conservation of mass and energy is the burning of a candle(Fig.2). When a candle burns, the wax acts as a fuel to generate the light energy to illuminate space around the candle. Thus the mass (m) of the wax is transformed into light energy (E) which travels with the velocity of light c . The mass (m) is equivalent to the ratio of emitted energy to the square of velocity of light ($m = \frac{E}{c^2}$). The rate of emitting energy is proportional to the rate of consuming the mass.

$$\frac{dE}{dt} = c^2 \frac{dm}{dt}$$

12) Man travels with speed of light

If an object travels at speed of light ($C = 300,000 \text{ Km/s}$), its mass will increase exponentially and mass will become infinite. Therefore infinite energy will be required to move the object, which is impractical. Hence no particle can move at the speed or faster than the speed of light. However as per the NASA reports Astronauts have touched the maximum speed of $39,897 \text{ km/h}$ ($11,082.5 \text{ m/s}$) relative to earth and a hundred years ago people had not imagined a human could travel at a speed of nearly $40,000 \text{ Km/h}^{14}$ in space.

By assuming if we overcome the technological obstacles in building faster space crafts, our fragile, mostly water bodies cannot sustain the new hazardous that arise due to such high speed. Humans may face strange symptoms due to the gravitational forces from head to toe and vice-versa, such as temporary vision loss and sensation of either leadenness (heavy) or weightlessness, the eyes and brain become starved of oxygen as blood collects at lower end⁹.

As discussed in my previous paper¹⁷, the incidents in Ramayana describe that Sri Hanuman travels in space to swallow the delicious fruit Sun, and in another episode He goes in the air to procure Sanjivani herb from Himalayas⁷. These episodes generate concepts that man can travel in the space. In fact they were staunch devotees and had divine powers.

Time versus speed (Time dilation)

A person traveling at almost speed of light, he would experience a slowing of time called time dilation¹⁰. He moves slower than who is at stationary (observer) on the earth. If a person is traveling at 90% of the speed of light, then that person would experience that his clock moves fast by 2.3 times that of stationary clock on the ground. In other words the time is increased by 130%. It means the stationary clock on the ground is measured to be running slow by 130%. These variations will be noticed when objects approach at the speed of light at the order of 30,000 km/s (1/10 the speed of light) then time dilation becomes important. However in ordinary life, if objects travel at lower speeds where $v \ll c$, these time dilations effects are not appreciable and can be ignored for most purposes⁹.

13) Energy and Sound

When the high speed air (energy) flows through a small slit (space), sound is produced. Sometimes melodious music can also be generated by controlling the intensity and speed of air, the slit width and time of flow. Thus the musical instruments produce sound of different pitch and intensities.

14) Energy gives life and death

The energetic air gives a life as well as death when controlled by time and space. When the space between the two nostrils is open, air goes inside the body then life continues and when closed for a certain time death occurs.

III) Discussions

The metaphysical analysis study on various applications presented in this paper illustrate that there is no action and activity in the universe without the application space, energy and time. The human achievements, huge accumulation of wealth, energy gain and loss depend on these universal parameters. The peace and harmony can be preserved in any mechanical system or in human organizations or society if the rate of change of pressure and energies are maintained within in the critical value otherwise explosions or chaos take place.

The vedic science presents many classical examples such as vibrations of energy in space, man travel in space, transformation of mass and energy vice-verse. The staunch devotees receive the

blessings and gifts in the form of materials for constructive or destructive purposes¹⁷. This is similar to the Einstein's mass and energy relation. The distance between the earth and sun and the seven colours of Sun light were described in Vedic literature¹⁷. Some of the modern scientific theories and calculations agree with those Vedic of calculations.

The concepts presented in vedic literature provide lot of information which require intensive study. Theoretically we can say that the rate at which the scientific technology is advancing for the past two centuries, one day we may see that matter / material may be transformed in a short duration of time through any new mode of propagation.

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