

A CRITIQUE OF THE EINSTEIN MODEL

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ABSTRACT: A wave exists only in its propagating medium but Einstein erred to discard the medium for light wave and to introduce the non-existent 4-D spacetime continuum instead. It denied him the chance to address the intrinsic wave-quantum Unity of light and predict the new entity of 'basic substance' to compose all forms of E & m so compellingly demanded for the inter-conversions of E & m by the eqn. $E=mc^2$, which is now re-derived. Unified Theory gives cogent arguments and experimental support for the existence of a real physical medium in space, the all-composing & all-pervading 'sharmon medium' as Basic Substance. It propagates light as a wave-quantum UNITY. The non-substantive abstract concepts of space & time evolve from our perceptions of successive motions & changes in the surrounding objects and cannot fuse into any concrete spacetime continuum. If existent it would retard motion of heavenly bodies and of even photons to propagate light, which is not actually observed. The non-composite static spacetime cannot undulate to transmit light. Various multidimensional spacetime continua are mere mathematical constructs and theories based on them unrealistic. Unified Theory explains from sharmon medium the constancy & invariance to source-observer motion, the two pillar postulates of Special Relativity without validating SR. It explains the Michelson-Morley and Sagnac experiments as also the observed variability of light velocity and superluminality, which invalidate Relativity Theories. Lorentz transformations do not describe any natural motion since no velocity can vary (like v) with, and be invariant (like c) to, a source-observer motion at the same time. The actual length of an object, viewed by say, 100 differently moving observers cannot undergo 100 different objective contractions at the same time, making 'contraction of length' an unrealistic concept. So is 'dilatation of time'. But the results of Gravity Probe-A are consistent with Unified Theory. Unified Theory re-explains Photoelectric Effect and Bending of Light in a Gravitational field, proving that photon has a gravitational mass and gravitation is not a curvature of non-existent spacetime continuum. In Unified Theory, as against Relativity, no particle or energy quantum is massless or sizeless point.

Standard Model is the conceptual soul for the body framework of a theory. Chapter-1 has presented the Standard Model underlying Unified Theory and the Modern Standard Model constituting the guiding core for the current theories of Physics and Cosmology. However, the Einstein's theories and thoughts had a profound influence on the twentieth century Physics. So much so that one can identify the 'Einstein Model' as an inseparable significant part of the Modern Standard model.

This Chapter will reappraise the conceptual component of the Einstein Model, which lies beneath its mathematics, to bring out its unrealities and rectify the same through Unified Theory. But before doing so we would consider the 'Maxwell Model' and the 'Planck Model', which in fact formed the forerunner bases of Einstein Model.

1 The Maxwell Model

In his theory of electromagnetic radiation, Clark Maxwell [2] derived the velocity of electromagnetic waves as

$$c = (\epsilon_0 \mu_0)^{-1/2}.$$

where ϵ_0 is the electric permittivity and μ_0 the magnetic permeability of the free (empty) space.

The value of c ($= 2.997 \times 10^{10}$ cm/sec) calculated for his theory from the known values of ϵ_0 ($= 8.85 \times 10^{-12}$ Farad/meter) and μ_0 ($= 1.26 \times 10^{-8}$ Henry/meter) for free space or vacuum came out to be equal to that of light in vacuum. Since the light from the sun to the earth travels mostly in vacuous space Maxwell declared that light is an electromagnetic **wave** propagated in empty space or vacuum. Thus the seed idea of a 'wave without its propagating medium' was created by Maxwell, which was later adopted and promoted by Einstein in relativity theories (see below).

The Maxwell Model comprises the assumptions made and the conclusions arrived at in his theory. These are:

- (a) Light is an electromagnetic wave.
- (b) The electromagnetic waves, including light, are propagated in the free space or vacuum without any real physical medium.
- (c) The velocity of electromagnetic waves, including light, in vacuum $c = (\epsilon_0 \mu_0)^{-1/2}$ depends on the electric permittivity ϵ_0 and magnetic permeability μ_0 of the free space.
- (d) Since the electric permittivity ϵ_0 and magnetic permeability μ_0 of the free space are constant, the velocity c of the electromagnetic waves, including light, is constant.

2 The Planck Model

Starting from the 'law of equi-partition of energy', Raleigh & Jeans found that the energy density E_ν for frequencies between ν (Greek, new) and $\nu + d\nu$, is

$$E_\nu = (8 \pi \nu^2 / c^3) KT.$$

Here K is the Boltzmann constant, T the absolute temperature and c the velocity of light in free space.

This Raleigh-Jeans law agrees with the experimental results at low frequencies. But at higher frequencies its integral leads to *infinite* total energy density, which has been called the "*ultraviolet catastrophe*".

However, Max Planck [3] hypothesized that the law of equi-partition of energy was not applicable to the black body radiation because the micro oscillators exchange energy with the surrounding environment not in a continuous manner but as the quanta of discrete units given by

$$E = h \nu.$$

Here h is a universal constant, now called Planck's constant of action. His expression for the energy density is

$$E_\nu = (8 \pi h \nu^3 / c^3) / (e^{h\nu / KT} - 1).$$

This Planck's law agrees with the experiments at all frequencies, lower to higher. The ultraviolet catastrophe is avoided because the available energy states at high frequency ν are now widely separated.

This represents the spectrum of the electromagnetic radiation filling the space. It leads to Stefan-Boltzmann fourth power law, namely,

$$E_T = \sigma T^4.$$

Here E_T is the total emissive power or the total energy density of radiation emitted from the black body at the absolute temperature T . The E_T is proportional to fourth power of the absolute temperature. The constant of proportionality σ (Greek, sigma) is the Stefan-Boltzmann constant. It implies that at the absolute zero temperature the energy density is zero ($E_T = 0$ for $T = 0$) and the radiation disappears.

That is, the perfect vacuum is possible, which is empty of all solids, liquids and gases and also can be freed of the thermal radiation by cooling the void.

Since absorption is only reciprocal to the phenomenon of emission the Planck Model essentially connotes that the electromagnetic radiation is emitted and absorbed as quanta of energy $E = h \nu$.

It also supports the existence and the possibility of experimental creation of absolute vacuum. A tacit assumption in Planck Model, like the Maxwell Model, is that the energy quanta of electromagnetic radiation, including light, do not need a physical medium for propagation.

3 The Einstein Model

Einstein [4-6] adopted the Maxwell Model and the Planck Model in a somewhat extended and modified form.

3.1 The Newton's corpuscular theory revived

Einstein [4] extended the Planck Model and postulated that the electromagnetic radiation, including light, of frequency ν and wavelength λ is not only emitted and absorbed but also propagated as quanta. of energy $E = h\nu$ and momentum $p = h/\lambda$. Lewis in 1926, named this energy quantum of light radiation as 'photon'.

This in a way revived the Newton's corpuscular theory of light. With this theory Einstein [4] explained the 'photoelectric effect', which won him the Physics Nobel Prize in 1922. But see sec. 4.4 below for Unified Theory explanation of the photoelectric effect.

3.2 The theory of special relativity

In accord with the Maxwell and Planck Models Einstein [4-6] stated that the light photon [4] and the electromagnetic [4, 5] and gravitational [6] waves are propagated in the free space without a physical medium.

He dismissed and discarded the light medium as superfluous for his mathematical theories and went further to introduce the 4-dimensional spacetime continuum instead to propagate electromagnetic and gravitational fields, forces and waves [5, 6].

The constancy of light velocity in Maxwell Model was upgraded as the pair of two postulates of the theory of Special Relativity [5]. He postulated that the velocity of light c is not only constant but also invariant to the source-observer motion. That is the light velocity remains unchanged as c and does not add up to $c+v$ if and when the observer moves with a *uniform* velocity v relative to the source of light. The Special Relativity is also sometimes called the Restricted Theory of Relativity because it is restricted to the uniform motion (v) of the observer relative to the source. The theory of General Relativity removes this restriction. See below.

For an observer moving with a velocity v along the x -axis of the stationary frame of reference the space and time coordinates x and t appear as x' and t' on the moving frame given by the so named Lorentz transformation formulae

$$\begin{aligned} x' &= \beta (x - vt) & t' &= \beta (t - vx/c^2) \\ \Delta x' &= \beta (\Delta x - v\Delta t) & \Delta t' &= \beta (\Delta t - v\Delta x/c^2) \end{aligned}$$

and reciprocally

$$\begin{aligned} x &= \beta (x' + vt') & t &= \beta (t' + vx'/c^2) \\ \Delta x &= \beta (\Delta x' + v\Delta t') & \Delta t &= \beta (\Delta t' + v\Delta x'/c^2) \end{aligned}$$

Here $\beta = (1 - v^2/c^2)^{1/2}$.

The length $l' = dx' = l/\beta$ at rest on the moving frame with its both ends observed simultaneously ($dt' = 0$) appears shorter as l on the stationary frame and also reciprocally the length $l = \Delta x = l'/\beta$ at rest in the stationary frame ($\Delta t = 0$) appears shorter as l' in the moving frame.

That is, when two bodies are in relative motion, the lengths appear shorter on the other than on themselves reciprocally in the same ratio of $1 : (1 - v^2/c^2)^{1/2}$. It is called Lorentz-Fitzgerald contraction [7]

after the initial authors of the hypothesis, which Einstein thus supported, with this mathematical derivation of the same formula.

On the other hand

$$\Delta t' = \beta \Delta t.$$

is the relation between the time intervals on the two frames.

That is, the interval of time $\Delta t'$ between two events at the same site ($\Delta x' = 0$) is minimum in the reference frame stationary with the site of events. In a frame moving in relation to the site of the natural event, however, the time gets dilated or slowed down.

The kinetic energy E of a particle of mass m moving at a velocity v is $E = mc^2 (1/\beta - 1)$ and not $\frac{1}{2}mv^2$.

The kinetic energy E becomes infinite when $v=c$. So c is the upper limit of natural velocities and no particle with mass (>0) can move at a velocity $v \geq c$.

The expression for the total energy

$$E = c (m^2 c^2 + p^2)^{1/2}$$

predicted the massless ($m = 0$) particles, like photon, moving at velocity c with momentum p and kinetic energy $E = pc$.

During the inter-conversions of energy E and mass m , as for example during the creation and annihilation of electron-positron pair or for the nuclear reactions, the relation $E=mc^2$ holds [8]. That is one gram of mass yields $\sim 9 \times 10^{20}$ ergs of energy. The mc^2 is the energy content of a body with mass m .

An elementary particle does not have a composition. Hence it is extremely rigid and cannot deform. So a force must be transmitted to its whole instantly. An electric force, for instantaneous transmission to the whole of a particle with more-than-zero finite size, needs a velocity $> c$, which is prohibited by Relativity. Therefore in the current Relativistic Quantum Electro Dynamics, all elementary particles like electron, proton, neutron &c are sizeless points

3.3 The theory of general relativity

As mentioned above the theory of Special Relativity [5] had restricted the invariance of light velocity c to the uniform motion or velocity (v) of the observer relative to the source of light. The theory of General Relativity [6] removed this restriction. It stated that the light velocity c is invariant to any non-uniform source-observer motion.

The rectilinear world line element ds of the Special Relativity [5] is defined by the relation

$$ds^2 = c^2 dt^2 - (dx^2 + dy^2 + dz^2),$$

And the uniform velocity v of the source-observer motion is given by

$$v = (dx^2 + dy^2 + dz^2)^{1/2}/dt.$$

In the theory of General Relativity [6], however, the curvilinear line element ds for a non-inertial frame is given by

$$ds^2 = \sum g_{mn} dx_m dx_n, \quad m, n = 1 \text{ to } 4$$

Here the metric tensor g_{mn} of the non-Euclidean 4-D spacetime is a function of the three space coordinates x_1, x_2, x_3 and the time coordinate $x_4 = ct$, c being the velocity of light photon in vacuum.

The General Relativity [6] treats the 4-D spacetime as an entitative continuum and applies to it the Riemannian differential geometry to develop a theory of gravitation.

The 4-dimensional spacetime continuum curves under a gravitational field. Therefore a ray of light from a distant star bends around a heavenly body of mass M and radius R by an angle θ given by the following relation.

$$\theta = 2GM/Rc^2 \text{ radian.}$$

Arthur Eddington verified this relation during the total solar eclipse on May 29, 1919.

The free motion of a mass body, not subjected to external force, is uniform in a straight line. In a gravitational field, all bodies have the same acceleration. And freely moving bodies, when viewed from a uniformly accelerated non-inertial frame, appear to have an equal and opposite acceleration. That non-inertial reference frame, therefore, is equivalent to a “certain” gravitational field. This is the “Principle of Equivalence” [6] in the general relativity.

3.4 *The conceptual content of the Einstein model*

The Einstein model can be summed up to contain the following conceptual assumptions and conclusions.

- (a) The 4-dimensional spacetime continuum propagates electromagnetic and gravitational forces, fields and waves.
- (b) There is no real physical medium in space to propagate electromagnetic radiation, including light.
- (c) The electromagnetic radiation, including light, of frequency ν and wavelength λ , is not only emitted and absorbed but also propagated as freely moving particles or quanta of energy $E=h\nu$ and momentum $p=h/\lambda$.
- (d) The velocity of light in vacuum is constant and invariant to source-observer motion, whether uniform (Special Relativity) or non-uniform (General Relativity).
- (e) The light velocity in vacuum c is the upper limit of natural velocities. No material body with a more-than-zero mass can move with a velocity $v \geq c$.
- (f) The photon, graviton, gluons, neutrino and the antineutrino, which move at a velocity of c are massless.
- (g) The non-composite elementary particles like electron, proton and neutron are sizeless points.
- (h) The length contracts and time slows down as and when observed from a frame moving relatively to the site of an event.
- (i) The gravitational field curves the 4-dimensional spacetime continuum. Therefore, the ray of light bends in a gravitational field.
- (j) A uniformly accelerated non-inertial frame is equivalent to a “certain” gravitational field.
- (k) The energy E and mass m are interconvertible according to the relation $E=mc^2$.

4 **The Unified Theory reappraisal of the Einstein model**

4.1 *Unreality of the spacetime continua*

In Unified Theory (UPT) [1] the space and time are not real physical entities having substance but are mere concepts evolving from the direct human perceptions of successive motions and changes in the surrounding objects. The concept of space arises from the successive perceptions of ‘there, here, there’ and that of time from successive ‘then, now, then’. Movement of the ‘time arrow’ only forward and never backward arises because of the irreversibility of the underlying natural processes of change. These two concepts of space & time are too intangible and abstract to fuse into any tangible spacetime continuum. In fact the existence of any continuum would have retarded, nay prevented, the motion of heavenly bodies through it, which is not actually observed. Therefore all the various spacetime continua of 4, 5, 10, 11, ...32 dimensions are mere mathematical constructs bereft of real physical existence and theories of relativity [5, 6] and others [9-13] based on them are unrealistic.

The multidimensional continua, if existent, would prevent or at least retard the motions of fundamental particles, material bodies, planets and galaxies &c, through them. And there would have

been no free motion, not even of the photon. But none of such speed retardations has ever been actually observed to contradict Newton's first law of motion.

4.2 The 'sharmon medium' in space is real

James DeMeo [14] gives a comprehensive and up-to-date review of the experimental work on measuring the ether drift. Interestingly DeMeo cites Dayton Miller:

"The effect [of ether-drift] has persisted throughout. After considering all the possible sources of error, there always remained a positive effect." — Dayton Miller (1928)

Dyton Miller's 'positive' results yielded more-than-zero ether drift as evidence for the existence of 'ether' or a light-propagating medium in space.

The Unified Physical Theory (UPT) [1] presents convincing scientific logic for the 'sharmon medium' composed by the new particle 'sharmon', which in turn is made of the two micromost basic elements: electrically positive *positrino* and negative *negatrino*. The positrino and negatrino compose all forms of energy, mass, energy quanta, particles of matter and antimatter in the Cosmos, hence given the common name '*cosmino*'.

A cosmino has the diameter $l_p = 1.6 \times 10^{-33}$ cm, mass = 2.596×10^{-48} gm, electric charge = $\pm 1.3729 \times 10^{-30}$ esu, and spin = $\pm 1/2$. The sharmon mass is 5.192×10^{-48} gm. Its spin is 0 or 1.

The time-averaged inter-sharmon distance $\sim 10^{-5}$ cm compares with the Mean Free Path for the real gasses (e.g. for Hydrogen 1.12×10^{-5} cm, Oxygen 0.64×10^{-5} cm, Nitrogen 0.595×10^{-5} cm). Therefore sharmon medium is a kinetic gas with its **number density** $n_s \sim 10^{15}$ sharmons per cm^3

The '*sharmon medium*' propagates electromagnetic and gravitational forces, fields and waves and emerges as the all-composing and all pervading basic substance.

4.3 Propagation of wave-quantum unity of electromagnetic radiation in Unified Theory

From origin to the terminus, the 0-spin sharmon-packet energy quantum per unit frequency cycle is propagated, as corpuscular "energized 1-spin sharmon", along a transverse electromagnetic wave in the sharmon medium contiguously via 1-spin sharmons, which do not physically move but only provide a physical carrier. The 1-spin sharmons, participating in the process of propagation, return to their 0-spin state on transferring the wave energy quantum to the contiguous neighbour in the medium or finally to the target.

After emission and before absorption it is always the energized 1-spin sharmon, which in deference to convention and for continuity is still called 1-spin "**photon**". But Unified Theory [1] denies the existence of conventional 'photon'.

Since the spin of an emitter or an absorber does not change what is emitted or absorbed is NOT the 1-spin photon as a whole but only its energy comprising 0-spin sharmons. However, the transmission, always and throughout, is of the energy of the 1-spin photon as a wave-quantum UNITY. The 1-spin photon as such is **not** emitted, propagated or absorbed.

The **Quantum Theory** (QT) [15] could not satisfactorily explain why the electromagnetic radiation behaves sometime as a wave and at other time as a particle. Moreover, it also wrongly split the coexistent intrinsic *wave-quantum unity* of radiation into *wave-or-quantum dualities*.

In fact both radiation and moving material particle have intrinsic **wave-quantum unity** (of UT), which appears as **wave-or-quantum duality** (of QT) due to experimental limitations to observe only one of the two coexistent characters at a time, not both simultaneously.

Einstein was conspicuous for ignoring and not addressing the wave-quantum unity of radiation and moving material particles. His theories [4-6] did not, and in fact could not provide any explanation for these phenomena. He even did not elucidate the physical mechanisms for the propagation of the electromagnetic and gravitational waves in the 4-D spacetime continuum. The particulate photon of his corpuscular theory [4] could not avoid sharing the source-observer motion. Hence its velocity could not be invariant to source-observer motion as required by his own theory of special relativity [5].

But interestingly, both the particle and wave aspects for both low intensity light and stream of electrons have been demonstrated [16] simultaneously in one and the same experiment. This provides experimental support to UT's wave-quantum unity against Quantum Theory's wave-or-quantum duality.

4.4 *The Unified Theory explanation of photoelectric effect*

Einstein [4] explained the photoelectric effect by postulating that light is propagated as quanta and the energy of one particulate photon is imparted to one electron, which overcomes the force or energy binding it to the metal surface.

In UT, the energized sharmon replaces the photon. If w is the energy binding the electron with the metal surface or the work function of the metal, ν the frequency of the incident ultraviolet light and hence $h\nu$ the energy of the energized sharmon, the kinetic energy E of the ejected photoelectron is given by

$$E = h\nu - w.$$

This is exactly the well-known Einstein equation [4] already verified by experiments.

4.5 *Constancy & invariance to source & observer motion of the light velocity*

The special relativity [5] was based on these two axiomatic postulates, which Einstein did not explain but are now explained realistically from UT. However this UT explanation does not validate the theory of Special Relativity (SR). Not only this, the UT can even explain the actually observed variability of light velocity c , which invalidates both the special and general theories of relativity.

Light begins creatively at the 'origin' and ends vanishingly at the 'terminus', both in the sharmon medium. The particulate photon energy comprising 0-spin sharmon aggregate per unit frequency cycle is carried along the transverse electromagnetic wave from origin to terminus via contiguous mechanisms.

Due to creative origin in the medium the light velocity c is independent of the source motion and destructive termination makes c independent of the observer motion. The constancy and invariance to source-observer motion of c ($= (e_0 \cdot \mu_0)^{-1/2}$) also follow from the fact that the e_0 & μ_0 of the sharmon medium are constant and not affected by the motion of the source or observer.

These conclusions from Unified Theory explain the results of the Michelson-Morley experiments and also the Sagnac experiment. In the 1913-experiment performed by French physicist Georges Sagnac a platform rotated uniformly around a vertical axis at 1-2 rotations per second. In an interferometer mounted on the platform, two interfering light beams moving in opposite directions produced interference fringes recorded photographically. Sagnac observed a shift of the interference fringes every time the rotation was modified. This is tied to the relative time delay Δt with which the two light beams reach the interferometer. Considering his experiment conceptually similar to the Michelson-Morley one, Sagnac announced the proof of a space medium for light waves.

According to the Unified Theory the time difference for the two interfering beams is $dt = 2\pi rn/c$, r is radius of the rotating platform and n the rotations per second. Modifying n would shift the fringes by changing the time difference dt , as Sagnac actually observed. None of the over a score other explanations of Sagnac effect is so satisfactory and natural.

4.6 *Observed variability of c and superluminality invalidate relativity theories but support UT*

Nay, even the observed variability of c [17-19] and superluminality [20] (light velocity exceeding c), which invalidate the theories of Special & General Relativity, also follow from UT by merely affecting e_0 & μ_0 and refractive index μ_r of the propagating sharmon medium **locally**.

It may be re-emphasized here that not only in free space but also within any gross material medium whatever, the light does and can propagate only through the pervading subtle sharmon medium whose local e_0 , μ_0 determine the velocity of light in that medium.

The sharmons in the medium, which propagate light and the propagated sharmon-composed photons are ultimately made of the electrically charged $\pm ve$ cosminos. The sharmons have both electric and magnetic moments. All this gives rise to e_0 & μ_0 of the sharmon medium and photon's orthogonal electric and magnetic fields. The $e_0 = 8.85 \times 10^{-12}$ Farad/meter and $\mu_0 = 1.26 \times 10^{-8}$ Henry/meter customarily assigned

to vacuum are actually of the sharmon medium in free space. Hence $c = (e_o \cdot \mu_o)^{-1/2} = 2.9979 \times 10^{10}$ cm/sec is the phase velocity for individual photons in free space.

The group of photons comprising the light pulse and other conditions in experiments of Wang *et al.* [20] affect the shape of the pulse and e_o & μ_o of the pervading/propagating sharmon medium.

This affects the phase and group velocities (v , v_g) as well as the refractive index ($n_g = c/v_g$) in the gross medium. As against $L/c = 0.2$ ns to cover $L = 6$ cm in free space, the observed 62 ns time lead means that time lag = - 62 ns = $(L/v_g - L/c) = (n_g - 1)L/c$. That is $(n_g - 1) = -310$ for the light pulse inside the 6 cm cell with atomic cesium gas. Therefore, the refractive index n_g is -309 and the group velocity v_g is $-c/309$. This explanation adversely affects special relativity and quantum theory by necessitating a light medium but not the causality principle.

4.7 Unreality of the Lorentz transformation formulae

Lorentz arrived at his formulae to explain the null results of Michelson-Morley experiments and to save the ether at the same time. Einstein discarded the ether but derived the same formulae. Unified Theory explains the MMX results from first principles based on the light propagating Sharmon Medium and rejects the Lorentz formulae as unrealistic, un-necessitating the work of Lorentz and Einstein both.

The velocity of light c is constant and invariant to source-observer motion but that of a material particle or of a reference frame v is not so. Thus the kinematics of a light photon and a material particle are too exclusively different for giving same status to c and v and using them in a formula to describe any real motion. The speed of a real body cannot at the same time be variant (like v) and invariant (like c) to the source-observer motion.

Therefore the Lorentz transformations of Special Relativity [5] do NOT describe any actual motion in the real Nature. Their leading conclusions viz. 'contraction of space' and 'dilatation of time' are the unrealistic demands on Nature to change to fit their mathematics.

Even otherwise, the actual length of an object, viewed by say, 100 differently moving observers cannot undergo 100 different objective contractions at the same time, making the 'contraction of length' as unreal concept. Likewise 'dilatation of time' too is unrealistic.

4.8 Basic flaws in General Relativity

The General Relativity is flawed for using Reimannian differential geometry of a non-existent 4-D 'spacetime' continuum. It as a theory of gravitation and its equivalence of a gravitational field with a uniformly accelerated frame is incomplete since no coordinates' transformations of no non-inertial frame can eliminate the actual centripetal gravitational fields, whereas the fields to which non-inertial systems are equivalent vanish on transformation to an inertial system.

4.9 Bending of light in a gravitational field

A photon comprising sharmons of non-zero mass, experiences the acceleration due to gravity $g = GM/R^2$ of the heavenly body of mass M and radius R . Light from a distant star goes past the body in time $t = 2R/c$, to fall by the distance $s = \frac{1}{2}gt^2 = \frac{1}{2}(GM/R^2) \cdot (2R/c)^2 = 2GM/c^2$. For a distance D the light bends by the angle

$$\theta = s/D = 2GM/Dc^2 \text{ radian.}$$

This is exactly the Einstein formula for the bending of light in a gravitational field verified by Arthur Eddington during total solar eclipse on 29 May 1919, providing support to the Unified Physical Theory.

4.10 Earth's motion distorts the surrounding 'sharmon medium'

It is a common observation that a body carries with it and thereby distorts the immediately surrounding viscous medium in which it rotates or moves. The earth moves through the viscous 'sharmon medium' while it also rotates or spins and revolves around the sun in an orbit. It thus distorts the surrounding sharmon medium, which propagates light as well as gravitation.

Dayton Miller [14] has measured the ‘ether drift’, which actually is the ‘drag’ of light propagating ‘sharmon medium’, combinedly created by earth’s spin and the revolutionary motion around the sun. And the Nature Physics Portal of 28 Oct’04 [21] cites the webpage <http://info.nature.com/cgi-bin24/DM/y/eQuV0Bhe3V0Ij0UsQ0Ad>, which can also be re-interpreted as presenting laser measurements on distortion of the gravitation propagating sharmon medium due to spin of the earth. See sec.5 below.

In fact the real physical sharmon medium in space can account for all that general relativity ascribes to the 4- dimensional spacetime continuum. But also see sec. 5 below.

4.11 *Interconversion of energy & mass*

The basic concept of the equivalence and inter-convertibility of energy E and mass m follows in UPT very naturally from the fact that the micromost elements, positrino and negatrino, compose all forms of energy and mass.

The radiant energy E is associated with momentum $E/c = (E/c^2) \cdot c = \text{mass } (E/c^2) \times \text{velocity } (c)$, relating E with radiant mass $m=E/c^2$ or giving $E=mc^2$ for the equivalence and inter-convertibility of energy E (erg) and mass m (gm). Einstein [8] generalized this relation and included the rest mass energy mc^2 in the relativistic total kinetic energy $E = c(p^2 + m^2c^2)^{1/2}$. *However the magnitude of constant k in the relation $E=km$ would depend on the nature(s) of E and/or m and will not always be c^2 , although the cosmino contents on two sides of the equation remain unchanged.* This is first because the units of different energies differ. Secondly, efficiency of the conversion of mass into energy $E \leftarrow mc^2$ or of energy into mass $m \leftarrow E/c^2$ is not 100% when a part of energy changes into unavailable form. In an irreversible process the forward and backward basic reactions or changes are not equally efficient. And most natural processes are irreversible.

5 **The emerging scenario**

‘Science’ is the creation of the scientists but not their exclusive ‘property’. After publication every piece of research becomes a common property. It affects all and therefore is the concern of every body. But sometimes the core basics of the theory are wrapped in technical jargon, which is not readily and easily comprehensible to the general reader. Nay, sometime, even the ‘scientists’ find it difficult to comprehend.

It is, for example, said that initially only three persons could understand the theories of relativity: the author Albert Einstein, mathematician Arthur Stanley Eddington and philosopher Bernard Russell. The difficulties were with the tensor mathematics of general relativity and also for the new abstract concepts about the nature of space and time. The most difficult to visualize was the unrealistic and nonexistent 4-dimensional ‘spacetime’ continuum, which propagates light and bends in a gravitational field.

Thus relativity was a conspicuous and effective beginning of the unrealistic Physics, although three decades earlier Maxwell had already postulated propagation of the electromagnetic light ‘wave’ in an empty space. The unrealistic and nonexistent 4-D spacetime of relativity theories [5, 6] was soon followed by a host of theories [9-13] based on spacetime continua of higher and higher dimensions wrapped in more and more abstruse mathematics and shrouded in increasing fantasy of (un)natural philosophies.

Thus, Einstein [4-6] set the trend for unrealistic Physics, others followed and carried it forward to make twentieth century as the *century of unrealistic Physics*. A host of these unrealistic concepts adding to some others coming from the quantum and string theories, have turned the modern Physics so unrealistic that even the most celebrated physicists cannot explain the objective reality the way one would like to through easily understood language and visualizable concepts. Incalculable amounts of funds and intellectual wealth of so many brilliant physicists have been wasted. Four-five generations were taught unrealistic Physics in the classrooms. Innumerable textbooks were written and articles published in scientific journals and lay press to spread the message wide.

I am constrained to make these remarks under the impulse of the concern for the development of realistic science. But no doubt, I have the greatest respect and admiration for the very bold mathematical physicist that Einstein was. Although he admitted that he never was clear and sure about the physical nature of the light photon yet carried, the bold mathematical logic of his belief in the ‘constant c in the 4-D spacetime’, with courage of conviction, to the two theories of relativity with so many astounding conclusions, which though unrealistic in nature are still holding the sway even after a century.

On 10th June 2004 the United Nations general assembly passed a unanimous resolution declaring 2005 as the “year of Physics” and asking UNESCO to organize events to commemorate the Einstein’s ‘groundbreaking’ papers published in 1905 [22]. The UN, by and large, is a political world body. It has pronounced a well-meaning innocent judgment, on behalf of all its member countries, on a controversial scientific subject.

The discussions in this paper, however, unravel the truth and help the readers themselves to see that the UN has exceeded its functional scope because the ill-informed UN members innocently and wrongly believe that Einstein was flawlessly right.

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