

Order, Disorder and Cosmos

Prof. S. K. Srivastava, D.Sc.

**Former Professor of Physics,
*Devi Ahilya University, Indore, India***

and

**Patron and Founder Members Board,
*International Disordered Systems Associates Society (INDIAS),
Allahabad, India***

1.Introductory:

First two words of the title-

order and **disorder**

are concerned with the way of arrangement of items, or bodies or entities.

Order represents the arrangement in a systematic way while disorder represents it in an unsystematic way.

The third word- Cosmos represents the whole existence around us such as- Nature, Universe and Superpower (God).

Cosmos in Sanskrit is called **space** or **sky-vacuum**.

In the very beginning, religion came forward to educate humankind.

Religious knowledge educated us about the existence of a superpower known as God.

Following Sanskrit mantra of Brahdaranya Upnishad describes that
Superpower-God as

ॐ पूर्णमदः पूर्णमिदं पूर्णात्पूर्णमुदच्यते ।
पूर्णस्य पूर्णमादाय पूर्णमेवावशिष्यते ॥

**Oum Purnamadah, Purnamidam, Purnatapurnamudachya;
Purnasya, Purnamadaya, Purnashivayashishyate**

Above description is about that Superpower-God. God is the only entity who is complete, shapeless, infinitesimal, existing everywhere, even in vacuum.

The sense of Nature comes through the existence of five natural things- kshiti (soil), jal (water), pavak (fire), gagan (sky, vacuum), sameera (air) and by the things made from them including life too.

The essence of above analogy may be seen in Sanskrit mantra:

ॐ नमः शिवायः
Om Namah Shivaayah

In my earlier paper ¹ it has been already discussed that when we reverse the words of above Sanskrit Mantra then the new word expresses the above five ingredients.

First of all, *Pythagoras* used the term “**Kosmos**” in 6th century for understanding the order of universe. Cosmos implies the whole space which consists of Nature, Universe and Superpower. The above cosmic knowledge tells us that our existence possesses the three entities- Nature, Universe and Superpower which may be discussed together by three-dimensional space description.

Cosmology is the study of the Cosmos in scientific, religious and philosophical ways. The scientific study of Universe is termed as **Physical Cosmology** where the term Cosmos refers to a particular space-time continuum perspective.

A circle drawn in two-dimensional space of Nature and Universe is called a **Cosmic Circle**, while a sphere drawn in three-dimensional space of

Nature, Universe and Superpower

may be called a **Cosmic Sphere** or **Light Sphere** as imagined by *Einstein*. We have made an effort to put all these three entities in three-dimensional space representation in a quantum model form.

2. Order- Disorder Concepts:

Nature behaves in ordered way while the behavior of Universe is random.

Order and disorder are opposite words like, complete-incomplete, symmetry-asymmetry, clean-polluted, good-bad, truth-lie, i.e. they are called **conjugate words**.

In order to understand the characteristics of order and disorder we consider Nature and Universe as two different entities which possess natural order and random characteristics respectively.

God's existence becomes a controversial issue due to invisibility.

God is unseen entity, only perception based faith exists there. Nature works in its own natural order depending on time factor 't'. Our Universe is composed of matter, radiation, space etc. Matter and radiation possess dual nature of particle and wave.

This behavior is due to existence of order and disorder characteristics.

Einstein discussed the conversion of mass- 'm' and energy- 'E' by the equation $E=mc^2$. This also describes that matter and energy are the two faces of a coin. Quantum Physics brought revolution after the establishment of Quantum Theory of Radiation given by Planck in 1900. Later on a quantum technique ² based on Order-Disorder Quantum Concepts have been found successful in describing the dynamics of different bodies and systems of Universe and Nature.

(A) Quantum Mechanical Introductory:

First of all, **Planck** considered radiation as energy and defined it as:

$$E = h \nu = hc / \lambda \quad (1)$$

Here, h : Planck's constant, λ : wavelength, c : velocity of light.

According to Planck's Quantum Theory of Radiation, the distribution of energy from one point place to other close point place is quantum in nature, i.e. the quantized particle of that energy is known as photon. The discrete nature of energy was considered by Planck first of all.

Heisenberg described his Uncertainty principle in differential representation.

The principle describes that it is impossible to measure simultaneously the minimum values of conjugate members of particular pairs of physical variables such as position: 'q' and momentum 'p' or time 't' and energy 'E', that describes the behavior of an atomic system.

The mathematical representation of the principle is given by:

$$\begin{aligned} \Delta q \cdot \Delta p &\geq h/2\pi \\ \Delta t \cdot \Delta E &\geq h/2\pi \end{aligned} \quad (2) \quad 6$$

DeBroglie has represented matter and energy forms together like:

$$\lambda = h/p \text{ or } \lambda \cdot p = h \quad (3)$$

$\lambda = c/v$ and $p = mv$. Here, m is mass and v is linear velocity.

Schrodinger used Planck's constant 'h' in his probability representation for the wave motion concept.

DeBroglie and *Schrodinger* both pointed out that

uncertainty in the measurement concept of *Heisenberg* is due to the presence of quantity 'h'.

It is because of indeterminacy phenomenon.

Uncertainty principle can't be verified because of

principle of conservation of energy.

(B) Quantum Representation:

Let us represent equations of Planck, *DeBroglie* and *Heisenberg* in quantum form.

Considering Quantization factor 'Q' = $\lambda / c.t$ or $\lambda / v.t$.

Planck's equation gives:

$$E = h/t. (1/Q) \quad (4)$$

which gives ordered form of energy as $E = h/t$ for maximum quantization $Q \rightarrow 1$. For disordered form of energy

$$(h/\Delta t) / \Delta E = Q; \quad Q < 1 \quad (5)$$

DeBroglie eq. (3) gives $cp = h/t (1/Q)$ which for maximum quantization condition $Q \rightarrow 1$ gives $cp = E = h/t$ which is ordered form of energy.

Disordered form of energy representation is same as followed in *Planck's equation representation*.

Heisenberg uncertainty principle is described by:

$$(h/\Delta t) / \Delta E \leq 2\pi \quad (6)$$

Comparing eqs. (5) and (6), it is noticed that right hand side quantities $\leq Q$ is somewhere related to 1 and 2π . It is noticeable that uncertainty in the measurement of ΔE is not only due to the measurement of Δt , h but also due to quantization factor Q .

When we include quantization factor Q in Heisenberg uncertainty principle, we find $[(h/\Delta t)/\Delta E] = 2\pi Q$, which for the value of Q [$Q=1/2\pi$] provides some correct meaning in terms of order and disorder. $Q \rightarrow 1$ is for ordered state while $Q < 1$ is for disordered state, which is associated with entropy.

Representation of 2π inside a spherical representation may be fruitful in three-dimensional representation of Energy, Time and Cosmic power.

Thus, it may be concluded that quantization of Energy factor 'Q' is affecting uncertainty principle i.e. measurement of ΔE is affected by three factors, 'h', ' Δt ' and 'Q'.

This conclusion inspired me to move towards the description of A Quantum Model, where Nature (Order), Universe (Disorder), Superpower (God) are considered in three-dimensional representation in Quantum conceptual way.

(C) Order-Disorder Transformation:

The measurement of minimum values

ΔO (ordered quantity) and

ΔD (disordered quantity)

simultaneously is difficult as Nature itself alters the situation

i.e. due to opposite characteristics on probability ground.

This may be expressed as:

$$\Delta O. \Delta D = H \text{ (constant)} \quad (7)$$

In a separate study ^{1,3} it has been shown that:

$$\Delta O. \Delta D \rightarrow \Delta t. \Delta E \rightarrow \Delta t. \Delta T = H \quad (8)$$

Under Order-Disorder concept the quantized form of energy wave function may be described by:

$$\Psi = \sin [(2\pi / \lambda) vt] \quad (9)$$

Let us consider that the probability distribution functional quantity $f(O, D)$ may be described by:

$$[f(O, D)]^{-1} = \lambda/vt = Q \quad (10)$$

Thus, we find

$$\Psi = \sin [2\pi \cdot f(O, D)] = \sin (2\pi/Q) \quad (11)$$

On applying the parity condition $\int \int \Psi \Psi^* = 1$ we find:

$$\int \int f(O, D) \Delta O \cdot \Delta D = 1/2\pi \quad (12)$$

where
$$f(O, D) = \exp [(E - E_O) / E_D] \quad (13)$$

i.e. in general it may be described as:

$$\int \int f(O, D) \Delta O \cdot \Delta D = \int \int f(t, E) \Delta t \cdot \Delta E = \int \int f(t, T) \Delta t \cdot \Delta T = 1/2\pi \quad (14)$$

This agrees with the Heisenberg result:

$$\Delta v \cdot \Delta t = 1/2\pi \quad (15)$$

(D) Action Quantization Process:

Order- Disorder Transformation reflects that determinism and indeterminacy happens in every action or event.

It is known that quantization of energy is an action process. The happening of every action or event may be represented by \mathbf{A} as described by:

$$\mathbf{A} = f(\mathbf{O}, \mathbf{D}) = (\lambda/vt)^{-1} = 1/Q \quad (16)$$

i.e. every action or event is a quantization process.

The happening of an action or event may be either in ordered state or in disordered state. The contribution of ordered energy and disordered energy in the action process may be described in the following way:

$$f(\mathbf{O}, \mathbf{D}) = \exp[(E - E_0) / E_D] = (\lambda/vt)^{-1} \text{ or } (\lambda/ct)^{-1} = 1/Q_1 \quad (17)$$

For $E = E_0$, $Q_1 \rightarrow 1$. For $E_0 = h/t$, the above condition holds good for E is not equal to E_0 , $Q < 1$. Such situation is associated with ordered and disordered states.

It also reflects that whenever the impurity level of disordered matter or energy goes on decreasing, the possibility of attainment of an ordered state arises, such happening may also be visualized in the following resemblances of quantization conditions.

$$Q = \lambda/ct = h/pct = E_O/E; \quad Q_1 = f(O, D) = \exp [(E - E_O) / E_D] \quad (18)$$

For $Q = Q_1$, we finally obtain:

$$[1 - (E_O / E)] [1 + (E_D / E)] = 0 \quad (19)$$

Above equation reflects that, the order factor E_O / E and
disorder factor E_D / E

affect a system or body in opposite ways. Also, increasing or decreasing of disorder factor has more effect than a variation of the order factor. Quantization value assesses that whenever a system or body is in ordered state or disordered state we have:

$$(h / \Delta t) / \Delta E = Q \quad (20)$$

From Heisenberg Uncertainty principle, we may say that:

$$[(h / \Delta t) (1/2\pi) / \Delta E] \leq 1 \quad (21)$$

From the above representation it is revealed that the uncertainty is due to Q effects.

For the ordered state $Q=1$. When we include factor Q in equation (21) we find:

$$[(h / \Delta t) (1/2\pi) / \Delta E] \leq 2\pi Q \quad (22)$$

which for the value of Q ($Q=1/2\pi$) takes the form of eq. (20).

The symbol \leq represents equality (=) sign for ordered state and less than (<) sign for disordered state.

Also (\leq) represents both the states together.

All this shows that Q should be included in Heisenberg's representation. This points out that

Heisenberg Uncertainty principle requires modification on Order-Disorder Transformation ground.

3. A Quantum Model in Cosmic Space:

Up till now, we have no **scientific technique** by which we may understand the secret of the dynamics of different occurring phenomena of Universe and Nature.

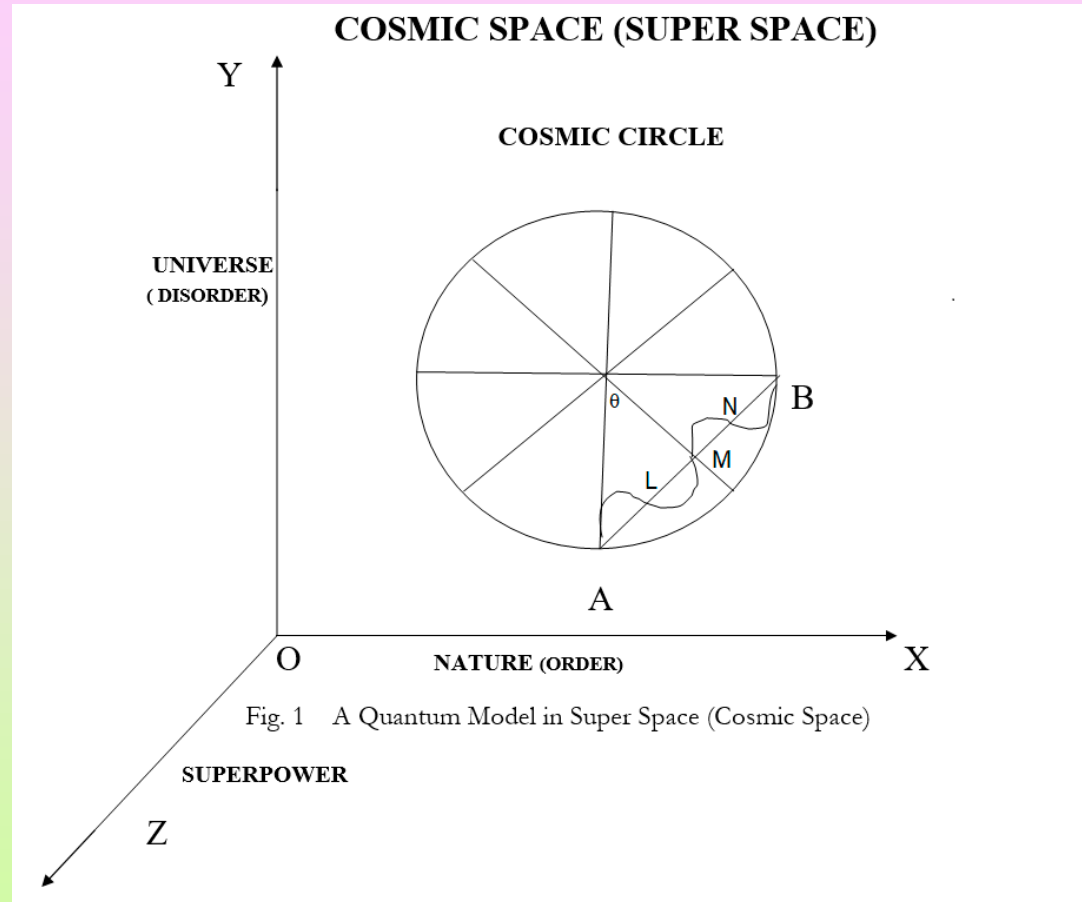
Here, a scientific technique has been described which has developed a **Quantum theory of Uncertainty principle in integral space.**

Let us consider a Quantum Model ⁴ in three- dimensional space of Nature, Universe and Cosmos.

We have discussed above, that any action or event **A** may be described by Order-Disorder transformation, as given by:

$$\mathbf{A} = f(\mathbf{O}, \mathbf{D}) = f(t, \mathbf{E}) = f(t, \mathbf{T}) = 1/Q \quad (23)$$

Here, Q is quantization quantity. The distribution function f (O, D) is described by eq. (13).



In the happening of action or event,

ordered energy E_O and
disordered energy E_D

interact with each other, which reflects that Nature and Universe take part in
their interaction.

In the given figure,
the happening of an action or event has been explained
inside a cosmic circle representation.

The Superpower represented by third
axis Z has been shown only for the observation purpose of action or event

i.e. **God acting as an observer.**

Let us divide cosmos circle in 8 equal parts in the form of segments.

Diameter of cosmic circle is $2r$.

Disorders move in the form of energy waves.

Let us consider a wave motion along chord AB. The trough and crust of a wave exist between line AM. λ is wavelength.

$$\text{Area of one segment} = (1/8)\pi r^2 \quad (24)$$

The length of the chord is given by

$$L = (1/8)\pi r^2 / 2r = \pi r / 16 \quad (25)$$

From figure 1 we have

$$L = (\pi r / 16) = 2r \sin \theta \quad (26)$$

Here θ is in degree. When θ is small, $\sin \theta = \theta$. Also $\theta^\circ = \pi \theta$ radian.

Thus, we have

$$L / 2\pi r = 1 / 32 = \theta(\text{radian}) \quad (27)$$

i.e., **Chord length / Circumference of Circle = $1 / 32 = \theta$ (radian).**

The function $f(O, D)$ represents an action happened within cosmic circle, which in Euclidian space forms following relationship

$$[2 \pi f(O, D)] = \theta = \omega t = 2 \pi \nu t = 2 \pi / Q; \quad Q = \lambda / c t \quad (28)$$

where ν is radiation frequency, ωt is angle subtended by chord of length $L = \lambda$ at center.

The variation of $f(O, D)$ concerned with variation of angular area of circular surface of cosmos circle. Above equation has been used in establishing Order – Disorder Transformations (ODT). The radius of circle is varying over integral surface area $\iint \Delta O. \Delta D$ according to the variation in the function $f(O, D)$ which follows.

$$\iint [2 \pi f(O, D)]^{-1} = \iint \Delta O. \Delta D = Q / 2 \pi \quad (29)$$

and balances the functions of order and disorder phenomena.

The creation of universe is based on matter – energy equivalence phenomenon which follows random behavior.

ΔO and ΔD represent the minimum discrete values of order and disorder quantities, respectively.

In Nature-Universe plane, when quantization $Q \rightarrow 1$ then there exists only ordered state, otherwise for $Q < 1$, there exists disordered state.

As soon as this cosmic circle takes the form of a cosmic sphere there is existence of ordered state. No disordered state exists there, i.e., there is no existence of Universe, only Nature exists.

The point from where Universe expansion began is the point of destruction and construction of the whole existence.

In view of *Albert Einstein* cosmic sphere may be called as

“Light sphere”.

4. Quantum Theory of Uncertainty Principle Or Indeterminacy Principle:

The importance of inclusion of quantization factor Q in Heisenberg's uncertainty principle has been explained above.

It is now clear, that uncertainty in the measurement of ΔE is affected by three factors 'h', ' Δt ' and ' Q '.

The description mentioned in sections 2 (C), 2 (D), 3(A) forms the basis of establishment of Quantum theory.

Above Quantum model description has provided:

$$\iint [2 \pi f (O , D)]^{-1} = \iint \Delta O . \Delta D = Q / 2 \pi$$

For quantization $Q < 1$, we find:

$$\iint f (O , D) \Delta O . \Delta D \sim 1/2\pi \quad (30)$$

which represents that in general:

$$\begin{aligned} \int \int f(O, D) \Delta O. \Delta D &\sim \int \int f(t, E) \Delta t. \Delta E \\ &\sim \int \int f(t, T) \Delta t. \Delta T \sim Q/2\pi \end{aligned} \quad (31)$$

For maximum quantization $Q \rightarrow 1$

This expression is concerned with uncertainty principle in integral space based on

order-disorder quantum concepts

which is useful to describe the dynamics of any quantum phenomenon and knowing its validity as well as sensitivity.

For $f(O, D) = Q = 1$, we get the following equation:

$$\int \int \Delta O. \Delta D = \int \int \Delta t. \Delta E = \int \int \Delta t. \Delta T = 1/2\pi \quad (32)$$

which represents that there is no indeterminacy.

The validity of any quantum phenomenon under $Q \rightarrow 1$ may be verified from eq. (31). Different meanings arise from eq. (32).

The product of the minimum values of the variables in integral space, provides a constancy of $1/2 \pi$

i.e. there is no quantization.

Such type of states represent vacuum i.e. there is neither presence of ordered state nor disordered state which means a **special type of ordered state**.

The understanding about

spirituality state and association of black hole

is concerned with such state, which has been discussed in further studies.

5. Application of Quantum Theory:

Above Quantum theory of Uncertainty principle of integral space has been successful in describing the

dynamics of Atomic systems,

Molecular systems,

Biological systems,

Biochemical systems,

Biomedical systems and

Social systems,

which has revealed many secrets of

Universe and Nature.

Few of them have been discussed here.

(A) PHYSICAL SYSTEM

(i) Spirituality:

Spiritualism is a search for sacredness. There is a cosmic or divine Superpower that controls Nature. It goes beyond religious or cultural boundaries.

Spirituality, usually associates with concentration and peace. Worshipping God or remembering the Superpower with full concentration is meditation, which is associated with spirituality.

The characteristics of matter and radiation are concerned with Order-Disorder Transformations.

The Order-Disorder Transformations play a prominent role during which a person with full concentration controls the organs of physical body system.

At that time there is attainment of ordered state, which may be pronounced as spirituality state, i.e. in such state there is no difference between relief (order) and sufferings (disorder), for a person and that person is called spiritual.

It has already been investigated ⁵ that the

Life- Soul complex energy (ordered form of energy) and
the quantized energy (disordered energy)

of high speed Liftons under relativistic concept through Order
Disorder Transformations generates two types of energies,

one is associated with positive thoughts and

the other is associated with negative thoughts (Maya)

in human mind.

The positive thoughts arise in human mind due to God's will and negative thoughts due to interruption of Maya.

Such a theory of success and failure has been already discussed in God equation.

The generated positive thoughts provide concentration of mind and help in the development of spirituality state.

Order-Disorder transformations occurring inside a cosmic circle, during an action or event

can be represented through a three-dimensional diagram and a Quantum model equation described below:

$$\int \int f(O, D) \Delta O. \Delta D = Q/2\pi \quad , \quad Q: \text{quantization} \quad (33)$$

i.e. the whole happening scenario of action or event is governed by quantum Q that is an observer / controller, situated along Z -axis of the figure.

For spiritual state [$f(O, D) = 1/Q = 1$]

and we find:

$$\int \int \Delta O. \Delta D = 1/2\pi \quad (34)$$

This is an equation of ordered state of
spirituality

which shows that such state occurs when a person fully concentrates towards spiritualism.

(ii) Quantum Gravity: Gravity is a quantum phenomenon.^{6,7} Present Quantum theory has been applied for understanding gravity under Order-Disorder Transformation concepts.

The absoluteness of Nature and randomness of Universe has been justified by considering ordered energy $E_O = mg^2 t^2$ generated during free fall motion of a body in Newtonian concept and disordered energy $E_D = mc^2$ created during mass energy conversion in Einstein's relativistic concept.

Under Order-Disorder Transformation concept, it is found that complete quantization condition Q has been fulfilled there.

Einstein mass – energy equivalence in order – disorder concept may be described by

$$E = m c^2 = [m_0 / \{ 1 - (v/c)^2 \}^{1/2}] \cdot c^2 = h c / \lambda = (h / t) \cdot (1/Q) \quad (35)$$

which for maximum quantization $Q \rightarrow 1$ leads to

$$[(E_{ph})^O]^{-1} \cdot E^D \rightarrow 1 \quad (36)$$

where the ordered form of energy $(E_{ph})^O = h/t$ and the disordered form of energy $E^D = [m / \{1 - (v/c)^2\}^{1/2}] \cdot c^2$, which show conjugate behavior.

Here, quantization quantity, $Q = \lambda / c t$. For the case where $v = c$, $E^D \rightarrow \infty$. That is to say, there will be destruction of the universe.

But ordered energy $[(E_{ph})^0]$ only will exist there, which means Nature will exist all around. Let us consider now, v [where $v = (2 g h)^{1/2}$] as escape velocity.

For the case where $g = 0$ (zero gravity), $(E_{ph})^0 = E^D$. In other words, there is no difference between order and disorder characteristics. No disordered state (pollution) is there.

Such a state is called a “vacuum state” and a black hole possesses such behavior.

An electromagnetic field exists inside the black hole in this state due to the presence of energy $(E)^0$.

That is why all matter and radiation moves towards a black hole and inside they get absconded. Infinite behavior corresponds to singularity.

Nature and the Universe exist only outside the black hole. Inside the black hole there is a dark space and dark energy.

According to *Einstein*,

gravity is the curvature of the universe and
world gravity is the curvature of space-time caused by massive objects which
wrap and curve the universe.

He also realized that the effects of acceleration and gravity were indistinguishable. Space wraps under accelerated motion.

Thus, according to *Einstein*, **gravity is the curvature of space-time**.

In Order–Disorder Transformation methodology, the quantum relativistic dynamic proposition of *Einstein* about the concept of gravity may be described by the equation:

$$\iint f (E_R, t) \Delta E_R \Delta t = 1 / 2\pi F_c \quad (37)$$

$$\text{Here } f (E_R, t) = \exp(E / E_R) \cdot \exp (- E_o / E_R) \quad (38)$$

where E_R is the energy with respect to the reduced mass of a system and F_c is a curvature force created during accelerated motion of reduced mass variation with time 't' accordingly. Here, effort has been made to observe the effect on the above proposition during the case of the force of gravity.

In the case of the force of gravity the disordered form of energy takes the form of potential energy developed during free fall motion under gravity g of a body, i.e.

$$\begin{aligned} & \cdot \quad r = H \\ & \int_{r=0} F_g \cdot dr = m g H \end{aligned} \quad (39)$$

Here F_g ($F_g = m g$) is the force of gravity and H is the height. Free fall motion of a body under Gravity (quantum field) describes that height H is given by:

$$H = (1/2) g t^2 \quad (40)$$

By using this value of H [$H = u t + (1/2) g t^2 = 0 + (1/2) g t^2$], the potential energy E takes the form:

$$E = (1/2) m g^2 t^2 \quad (41)$$

By taking potential energy as a disordered form of energy E_b and an ordered form of energy of a photon as $E_o = h/t$ (h = Planck's constant),

the Order–Disorder Transformations (ODTs) equation finally gives:

$$\iint Q_F \Delta E. \Delta t = 1/2\pi \quad (42)$$

where the quantization factor $Q_F \rightarrow 1$.

Here we observe the quantum nature of gravity. Earth's gravitational field is anything but even its lumpy changes depend on where we are. But what would happen if we lost it all together?

In an earlier study ⁶

$E_{\text{Pot}} = 2md^2/t^2$ [where the potential energy E_{Pot} was obtained after rationalizing the factor 'g' between the equations

$$E_{\text{Pot}} = m g d \text{ and } d = (1/2) g t^2;$$

where d stands for distance], we obtained the following same results of zero gravity:

$$\iint Q_F \Delta E. \Delta t = 1/2\pi \quad (43)$$

where $Q_F = 1$, which was the case of complete quantization and the Zeroth Law of Gravity, **so no quantum field effect is there.**

Similar observations were noticed by Chandrashekhar ⁸. MGR means Modern Gravity, the condition for the absence of any gravitational field associated with the vanishing of the curvature tensor.

The potential energy considered as a disordered form of energy was not having the gravity factor 'g', while the present form contains the 'g' factor.

Both studies give us an understanding about quantum gravity phenomenon and confirm the views of Einstein that the effects of acceleration and gravity are indistinguishable.

Thus, we come to know that gravity is
a quantum phenomenon.

According to Einstein Graviton (EGR) the gravity is manifestation of the

'curvature of space-time.'

This view of Einstein implicitly defines gravity (MGR) of
spirituality state.

(B) BIOLOGICAL SYSTEM

(i) Quantum Bio-radiation Formula: It is assumed that the radiation inside the human body is produced by some kind of resonators. Let us consider the displacement x of a bio-resonator in simple harmonic form. ⁹

$$x = A \sin [(2 \pi E_q (t, T))] \quad (44)$$

where A is the amplitude, T is temperature and t is time. $E_L (T, t)$ is given by:

$$E_L = E_L (t, T) = \epsilon_T v = \epsilon_T / t = Q_F \cdot k_B T, \quad (45)$$

where ϵ_T is called SYA constant and Q_F ($Q_F = \lambda / c t$) is the quantization factor. The dimension of ϵ_T is same as that of the Planck constant ' h ', i . e . energy \times time.

Then, by using kinetic theory, quantization process and using Maxwell-Boltzmann statistics, we obtain the number of modes of vibration or degrees of freedom per unit volume in the wavelength region λ to $\lambda + d \lambda$ as given by:

$$E_\lambda . d \lambda = [\{ (8 \pi / \lambda^4) \{ Q_F . k_B T \} \} / \{ \exp Q_F - 1 \}] d \lambda \quad (46)$$

$$\text{or} \quad E_\lambda = [(8 \pi / \lambda^4) \{ Q_F \cdot k_B T \} / \{ \exp Q_F - 1 \}] \quad (47)$$

where $8 \pi / \lambda^4$ is the number of degrees of freedom per unit volume. The above equation is called the

SYA Formula of Bio- radiation.

Case I : When $\lambda T \gg 1$ (Longer wavelength limit)

$$E_{\lambda} = (8 \pi / \lambda^4) k_B T \quad (48)$$

Case II : When $\lambda T \ll 1$ (Shorter wavelength limit)

$$E_{\lambda} = (8 \pi / \lambda^4) \cdot (k_B T \cdot Q_F) \exp Q_F \quad (49)$$

The dynamics of SYA radiation formula of Bio-radiation (having Lifton quantized particle),

$$E_{\lambda} = [(8 \pi / \lambda^4) \{ Q_F \cdot k_B T \} / \{ \exp Q_F - 1 \}]$$

and its limiting value in shorter wavelength region ($\lambda T \ll 1$) obtained here differs from ordinary radiation (having quantized particle photon) formulae.

There is closer agreement in the forms of SYA radiation formula and its form in shorter wavelength region while deviation exists in its forms as compared to longer wave length ($\lambda T \gg 1$) region.

It is noticeable that the product of quantity Q_F , the quantization factor and the average energy for each vibration degree of freedom, $k_B T$ is the quantized energy of biomaterial Lifton, which is the quantized particle of bio-radiation.

(ii) Bio-Radiation and Lifton Duality:

Bio-materials emit radiation known as bio-radiation. In the “Theory of Bio-radiation”⁹, it has been considered that the transmission of bio-radiation takes place in the human body system in the form of a special type of “Bio-resonator: Lifton” developed through ODTs.

Lifton is the life particle which provides consciousness to every cell and organ in the human body. A mother’s womb is the natural site where a fetus develops. The fetus is the developing embryo which is formed when an ovum is fertilized by a sperm within a protein cell. During fertilization, bio-radiation is generated due to quantized energy particle Lifton.

Before the delivery of a child, after 4-5 months of pregnancy, a time comes when a photon (external energy resource) interacts with a Lifton and through ODT Life-Soul complex energy develops^{5,11}

(bio-electromagnetic radiation - cosmic).

Different types of matter and bio-radiant energy exist inside the human physical body system.

Lifton energy, $E_L(t, T)$, and Lifton wave function, $\Psi_L(t, T)$, are bi-functional quantities of time 't' and temperature 'T' parameters as given by:

$$E_L(t, T) = Q_F \cdot k_B T = \epsilon_T / t = \epsilon_T v = \epsilon_t T \quad (50)$$

$$\Psi_L(t, T) = \sin [2\pi f(t, T)] = \sin [2\pi E_L(t, T)] \quad (51)$$

In the case of bio-radiation, we consider

$$f(t, T) = E_L(t, T) \cdot Q_F = (\lambda_L / c t)$$

is called a quantization factor. Here, $\epsilon_T = (\lambda_L / c) k_B T$, has been pronounced as a SYA constant and $\epsilon_t [\epsilon_t = (\lambda_L / c) k_B]$ as an equivalent thermal capacity constant of Lifton (Life particle), where k_B is the Boltzmann constant, c is the velocity of light and $v (v = c / \lambda_L)$ is the frequency.

In the order-disorder concept, we consider the disorder conceptual form of Lifton energy, $E_L(t, T) = \epsilon_T v = \epsilon_T / (Q_F \cdot t)$ and the order conceptual form of energy $E_L(t, T) = \epsilon_T / t$ for maximum quantization $Q_F (Q_F \rightarrow 1)$. The validity of Eq. (51) has been discussed in previous studies.

In the subsequent section (B), it is observed that the Lifton vibration generates thermal waves. Quantized energy particle Lifton follows a similar particle-wave duality as the quantized energy particle photon of solar radiation. The linear momentum, p_L , of the Lifton is given by

$$p_L = E_L(t, T) / c = \epsilon_T / c t \quad (52)$$

From the above Eq., after using the value of the quantization factor Q_F , we obtain

$$\lambda_L = (\epsilon_T / p_L) Q_F \quad (53)$$

The above equation is Lifton's wavelength – linear momentum relationship. This is Lifton's duality; ¹⁰ a relationship between the quantized wave-particle nature of Lifton. Eq. (53) which is very similar to de Broglie duality relationship for photons.

$$\lambda_{ph} = h / p \quad h = \text{Planck's constant} \quad (54)$$

A beam of bio-radiation has no mass but, if it is trapped in a protein cell group, then the Lifton would contribute to the total mass of that protein cell group. However, it does not mean that the bio-radiation has mass in general. Momentum p_L ($p_L = E_L(t, T) / c = \epsilon_T / \lambda$) of Lifton exists without mass and that is why Lifton is a mass-less particle.

(iii) The Dynamics Of Energy Of Consciousness And Soul:

A mother's womb is the natural site where a fetus develops. The fetus is the developing embryo which is formed when an ovum is fertilized by a sperm. The Theory of Bio-radiation [9] reveals the fact that the quantized energy particle, Lifton, is the content of bio-radiation just as the quantized energy particle, photon, is the content of light radiation.

Within a certain assigned time period, by nature/ Superpower the quantized energy of photon $E_{ph} (h/t)$, the content of sun radiation interacts with the embryo and some changes take place. The embryo within the womb emits some cosmic radiations, i.e., during fetus development, bio-electromagnetic radiations are generated which evolve the senses in the form of consciousness in every human cell and organ.

This present investigation reveals the fact that, in every cell and organ, there exists consciousness which enables the human brain to send signals through which actions can take place. The blended energy determined by the photon-Lifton interaction is the complex form of energy of consciousness (life) and soul which, under different conditions, represents the importance of the essence of Consciousness, Soul and Superpower.

We consider energy of a photon, ordered energy $E_{ph} = h/t$ and the disordered energy has quantized energy of a Lifton

$E_{Li} = (\lambda/ct) k_B T = Q \cdot k_B T$ then:

$$f(O,D) = \exp(E/Q \cdot k_B T) \cdot \exp(-(h/t)/Q \cdot k_B T) \quad (55)$$

$$\iint \exp(E/Q \cdot k_B T) \cdot \exp(-(h/t)/Q \cdot k_B T) \cdot \Delta t \Delta T = 1/2 \pi \quad (56)$$

We obtain from eq. (56), finally:

$$E = E_{L.S \text{ Complex}} = (1/2 \pi t) \exp(E_{ph}/E_{Li}) \quad (57)$$

The above energy E exhibits exponential behavior (growing behavior) during the life generation process.

Here, both the photon and the Lifton play prominent roles in the development of blended energy.

(iv) Human Life-Death Systems:

The secrets about the production of life and the occurrence of death have long been challenging and mysterious issues for human beings.

The beginning and end of human life are naturally defined by the onset and cessation of organism function.

The real dynamics of the beginning and end of human life is a very complicated process. A human being is a biological organism whose consciousness supervenes from its basic make-up.

We would like to discuss the inevitable process towards the biological phenomena of the production of life and occurrence of death.

It appears that death is an event that takes place at a set point in time when the collection of body processes that maintains homoeostasis finally cease. ¹¹

There is a need to discuss the biological energy decaying process of death. There is also a need to discuss a criterion used for the determination of death, i.e., the transition from the state of living to the state of non-living.

Living beings possess some physical principles of conservation and transformation of matter and energy.

Sun energy is a resource energy for every entity on earth and also the maintenance of life depends on the transformation of energy from the sun.

In an earlier study, ¹³ the dynamics of life and death phenomena were discussed on the basis of Order–Disorder Transformations (ODTs).

The total supplied energy to the human body has been considered as the sum of photon energy E_p , Lifton energy E_L and Gibbs free energy ΔG .

$$E_{\text{Total}} = E_{\text{Ph}} + E_L(t, T) + \Delta G = h/t + (\lambda/ct)kBT + \Delta G \quad (58)$$

Here the symbols have their usual meanings

According to the theory of bio-radiation,⁹ the radiation inside the human body is produced by some kind of resonators which are formed by the quantized energy particle, Lifton. The energy E_{Total} was considered as an ordered form of energy. From Einstein's mass–energy conversion formula $E = mc^2$, we considered mc^2 as a disordered form of energy. There is one more energy Life soul energy, EL-S Complex, which controls the human actions. The human life-soul complex energy (bio-electromagnetic radiation – Cosmic) EL-S Complex has been described by¹¹:

$$E_{L-S \text{ Complex}} = (1/2 \pi t) \exp (E_{Ph}/E_L) \quad (59)$$

where the photon energy E_{ph} and Lifton (life particle) energy E_L are the same as mentioned above.

In this study, we have included Life – soul energy EL-S Complex in E_{Total} and now E_O is the sum of four energies. It is done in order to understand the role of Life-Soul Complex energy EL-S Complex in the dynamics of the life-death system under order-disorder transformations.

The ODT equations are described by ⁷:

$$\begin{aligned} \int \int f(O, D) \Delta O \Delta D &= \int \int f(t, E) \Delta t \Delta E = (1 / 2\pi) \\ &= \int \int \exp(E / mc^2) \exp[-\{h / t + (\lambda / ct) k_B T + \Delta G \\ &\quad + (1/2 \pi t) \exp\{(-h / t) / \{(\lambda / ct) k_B T\}\} / mc^2\}] \Delta t \Delta E \\ &= (1 / 2\pi) \end{aligned} \quad (60)$$

On solving the above equation, we obtain

$$\begin{aligned} E \cdot t &= (1 / 2\pi) \exp(\Delta G / mc^2) \\ &\quad + (1 / 2\pi) [(h / t + \epsilon / t + \Delta G) / mc^2] \log t \\ &\quad + [(1/2 \pi t) \exp(-h / \epsilon T) / mc^2] \cdot (1/2\pi) [(h / t + \epsilon / t + \Delta G) / mc^2] \\ &\quad + [(1/2 \pi t) \exp(-h / \epsilon T) / mc] \cdot (1 / 2\pi) \exp(\Delta G / mc^2) \log t \end{aligned} \quad (61)$$

Here $\Delta G = \Delta H - \Delta S$. H is the Helmholtz energy function and S represents entropy. All four terms on the right-hand side of equation (61) are constant terms. The third and fourth terms contain Life-Soul complex energy.

As the body temperature goes on decreasing and $T \rightarrow 0$, $\Delta S \rightarrow 0$ and the third and fourth terms on the right-hand side go on decaying and following a new form of the above equation which indicates the tendency for the occurrence of death.

$$\begin{aligned} E \cdot t &= (1/2\pi) \exp(\Delta H / mc^2) \\ &\quad + (1/2\pi) \exp[(h / t + \Delta H) / mc^2] \log t \end{aligned} \quad (62)$$

$$E \cdot t = (1/2\pi) \exp (\Delta H/mc^2) + (1/2\pi) \exp [(h/t + \Delta H) / mc^2] \log t \quad (62)$$

On the right-hand side of the above equation, the behavior of time factor with respect to energy factor describes an exponential decay, which reveals that, for $t \rightarrow 0$, energy contribution in action process moves to ∞ value while at very large span to zero. It reveals the fact of the decaying process of energy as life span increases. Finally, the first term remaining describes the following action process.

$$E \cdot t = (1 / 2\pi) \exp (\Delta H / mc^2) \quad (63)$$

The remaining energy (remains after death for some moment),

ΔH , goes on decaying and lastly $\Delta H \rightarrow 0$ at death.

Actually, all energy during death converts into heat energy (First Law of Thermodynamics), which is a function of T and S and hence $\Delta H \rightarrow 0$.

In this transition period during the decaying of ΔH , the function of brain tissues might end. After death, what remains is the following equation:

$$\int \int \Delta t \Delta E = 1 / 2\pi \quad (64)$$

which is the quantum equation of the Uncertainty Principle in an integration approach.

Under a maximum quantization effect after the decaying of all types of energy of human body, what remains is quantum. This happening shows that quantum is the last existence.

It is remarkable that the action process of human life and death phenomenon begin from quantum and end on quantum through the following equation:

$$\int \int f(O, D) \Delta O \Delta D = \int \int f(t, E) \Delta t \Delta E = (1 / 2\pi) \quad (65)$$

which ends to the state of eq. (64), which is the quantum law of not only life but of whole existence.

When, in eq. (65), the distribution functional quantity

$$f(O, D) \text{ or } f(t, E) \rightarrow 1 ,$$

there is complete quantization, which is a natural happening under

order-disorder transformations.

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THANKYOU