Revealing the Phenomena of Heat and Photon Energy on Dealing Matter at Atomic level

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Abstract – Technology is in the way to reach its climax but the basic understanding of science in many phenomena is still awaited even though the nature witnesses them in many ways. Again, scientific research reveals strong analogy between photon and electron. Electrons of outer ring in a neutral state silicon atom execute confined inter-state dynamics as per exerting forces of their relevant poles where heat energy is accommodated while involving element of the force along their trajectories of forward-and reverse-direction cycles. An electron of the outer ring when undertakes the forces of relevant poles, one-bit of heat energy is accommodated along its trajectory of reaching to relaxation point. That electron starts undertaking the forces of opposite poles at the central point of relaxation state till reaching to nearby unfilled state where one-bit more heat energy along the trajectory is accommodated, thus, it depicts the force-energy shape-like ‘Gaussian distribution symbol having both ends turned’, which is termed as a unit-photon. At each point of turning, that electron introduced its influence of new forces where heat energy is also accommodated in a more curved manner. A confined inter-state electron-dynamics of silicon atom under the availability of heat energy in several bits results into generate force-energy shape-like a wave that can be in immeasurable length if its dynamics remain uninterrupted. The interruption of a confined inter-state electron-dynamics at any stage results into disconnects the increasing the length of a generating photon. Two-bits of heat energy is accommodated along the trajectory of inter-state electron-dynamics in the forward-direction cycle and two in the reverse-direction cycle. Inter-state dependent but path-independent forces exerting to an electron enable it to generate photon energy where auxiliary moment of
inertia is there only to recall each point of its turning. That electron doesn’t contact energy knot of its either state of dynamics. This mechanism of generating photon energy indicates that atomic structures of available elements are different to the presented ones. The two cycles (forward and reverse) of confined inter-state electron-dynamics formulate an overt photon—a photon length twice to unit-photon. A unit-photon under certain alignment when interacts to medium, it results to divide into two-bit heat energy. Under misaligned interaction of unit-photon to uncertain medium or further interaction of its heat energy of two-bits, it divides into tits-bits, thus, defining the typical heat. Atoms of different elements generate photons having different features. An isolated electron is grounded when it carries the forcing energy of an aligned photon where its impingement for gained instantaneous velocity to underlying certain solid-state atom results into distortion at the point of impact. Atoms vary the role of force-energy as per the nature of built-in gauge of their electron-dynamics and under different interactions also. Here, heat and photon energy explore matter at atomic level, so, at electron-level also, thus, describing the basis of science.

**Keywords:** Heat and photon energy; Fundamental forces; Energy conservation; Electron-dynamics; Atomic Scale Phenomenon

1. **Introduction**

Creation has been and is being benefited by heat and photon energy since the existence. Light has remained the unconditional gift of nature existing at earth and reaching it not only from the main source—Sun, but from other Planets and Stars also. Phenomena known by electrical discharge are continuously in study as well, since long. Catching fire in different types of matter and burning of various commodities are the usual phenomena gradually known since the existence of life. Everyone is taking benefits from these blessings but the understandings behind their phenomena are not only unclear, but their interactions to various sorts of matter are also peculiar.

Many studies are available in the literature dealing with light-matter interaction where it has been covered largely under a phenomenon, namely, surface plasmons. Origin of plasmons was explored in some early published reports [1-4]. A plasmon is a quantum
of plasma oscillation and represents the collective oscillations of the free electron gas density—a general definition extracted from the literature.

The interaction of light (photon) to matter is recognized in the form of various terminologies, namely, phonon, excitons, and plasmon, etc. Recently published review discusses the light-matter interaction by considering the properties of polaritons modes in two-dimensional materials and applications in a certain range of spectrum [5]. The concept of excitons (electron-hole pairs) was first proposed by Frenkel [6]. It deals with the excited state of an atom in a lattice travelling in particle-like fashion without the net transfer of charge. Excitons can be formed on the absorption of photon by a semiconductor (quantum dot) [7]; a phonon is a collective excitation in a periodic, elastic arrangement of atoms or molecules in condensed matter.

A vast number of studies deals with the different sorts of developing process of involving of tiny-sized particles. The tiny-sized cluster is a simple chemical compound which has a variety of important applications in diversified areas [8]. The unique nature of nanocrystals solicits the fabrication of new materials of controlled features [9]. The likely development of nanoparticles technology is an obvious long-term benefit [10]. With the success of assembling colloidal matter in a useful structure, the atoms and molecules will be treated as materials for tomorrow [11]. The investigation of the dynamics of an individual nanoparticle should be taken as a prime concern prior to go for further sound deliberations [12]. A good understanding on the surface features of nanoparticles will lead to the development of high order materials [13]. Tiny-sized clusters possess molecular-like electronic structures and non-fcc geometric structures [14]. Chemical properties of gold nanoparticles change with size [15]. The development process of various tiny-sized particles along with large-sized particles under varying concentration of gold precursor was studied in pulse-based electron-photon-solution interface process [16]. It has been discussed that localized dynamics of the process is one of the causes that contributes in evolving the structure of tiny-sized particles for gold [16-20], silver [20], and carbon [21, 22]. The study of tiny-shaped particle dealing elongation of atoms of one-dimensional arrays was also studied [23]. When the stretching of clamping energy knots to electrons of an atom is orientationally based, it is
related to its elongation behavior, which is under the exerting force along opposite poles of electrons in that atom, however, under non-uniform exertion of surface format forces, a deformation behavior of the atom is resulted where clamping energy knots to electrons stretch non-orientationally [24].

Sir Isaac Newton explained the gravity, called Newtonian Physics. There is no such concept regarding the opposite of gravity in the Theory of General Relativity as explained by Sir Albert Einstein. Bohr proposed that electrons move around the nucleus in allocated orbits where they have fixed energy if atom is in ground state. Therefore, the behavior of levitational force exerting at electron-level in atoms of all class of elements remains beyond the understandings, and the concept of band gap, valence band and conduction band dominated through all the ages in all related phenomena along with configuration of the shells and orbits. Thus, this negligence and mishap kept away the researchers from thinking and considering force-energy relationship in atoms of different elements which originated the causes of certain phenomena in their materials of all scales. A different force-energy relationship in gas and solid natured atoms has been explored in the recent study [25]. Although, huge efforts were made in exploring technological advances and breakthroughs, but the efforts put forth toward the basic and fundamental sciences along with the continuance in the explored ones remained less. Fundamental aspect of structure evolution in atoms of all those elements executing confined inter-state electron-dynamics was studied in a separate study [26]. Fundamental aspect of structure evolution in different state carbon atoms where involved energy engaged the non-conservative forces was also studied [27].

The interactions of photon to typical surfaces and a stationary electron are studied. A neutral state silicon atom was considered in this study transforming the heat energy into photon energy while executing its confined inter-state electron-dynamics. Here, charisma of an atom transforming heat energy into different featured photons is discussed. The analogy between photon and electron is explained setting a new era of science. The origin of governing phenomena of science in targeting many remarkable flourishing applications is also discussed.
2. Results and discussion

Under excess propagation of photons having characteristic of current through inter-state electron gaps of the flowing inert gas atoms (in certain density), they split into electron streams where their electrons under the forcing energy of carrying photons impinge to underlying atom either to further elongate it or to deform it depending on the mode of impingement [24]; if the impinging of electron streams to underlying atom is not at a fixed angle (orientation), the stretching of clamped energy knots to electrons is also non-orientationally based resulting into deformation of that atom, so, it doesn't modify structure into a structure of smooth element. Certain atoms of solid don't retain their original state behavior at instant of deformation under impinging electrons from the external source. But, they also deform under the process of synergy where, within their medium, they deal different sorts of interactions. Such deformation behaviors of atoms of tiny-sized particles have been observed in colloids of gold, silver and their binary composition [16-20]. Such deformation behaviors of atoms are also observed and discussed in the case of tiny carbon grains [21, 22]. A uniform elongation behavior of atoms of one-dimensional arrays was discussed where tiny-shaped particle of gold was taken as the model system [23]. Photonic current which is known in electric (electronic) current is referred when photons having wavelength of current (inter-state electron gap of the atom) in certain density propagate (or travel) through the suitable wire of metallic atoms where it doesn't infer the flow of any electron [24]. But, electrons can be the source of transforming heat energy into photons having characteristic current under confined inter-state dynamics in their atoms. For the solid natured atoms, a force-energy relationship shows a direct behavior, which is not the case in gas natured atoms [25]. A structure evolution in atoms of different elements where occupying three different levels of ground points is discussed where conservative forces involved to execute their confined inter-state electron-dynamics [26]. A structure evolution in different states carbon atoms is also discussed where electron-dynamics engaged the non-conservative forces [27].

Those studies enlighten us that energy and force together should make the photon when atoms of certain built-in gauge of their electrons absorb the heat energy. Under
suitable execution of confined inter-state dynamics of electron, exerting forces to its relevant poles are to be maintained in the conserved manner. So, resulting energy of the generated photon is to be conserved also. The absorbed heat energy by the atom is supposed not to be in the conserved manner but the gauge of electron-dynamics under maintained conserved forces is supposed to determine its discreteness on processing. That absorbed heat energy by the atom, which should be in the form of tits-bits, is supposed to act as element of the energy for generating a photon under the execution of confined inter-state electron-dynamics. Hence, this generated force-energy (photon) is supposed to be capable of propagating or traveling from one point to another point and, also, of propagating or traveling through the medium of inter-state electron gap where it is related to photonic current [24]. The word propagation is suitable when photons travel through the inter-state electron gaps of atoms while the word travelling is suitable when photons travel in the open medium other than inter-state electron gap. Thus, the smallest entity of a photon which deal the force and energy together, in travelling or propagating mode, can be referred to unit-photon.

A single cycle confined inter-state electron-dynamics of neutral state silicon atom results into generate force-energy in the smallest amount, which is termed as unit-photon. Thus, a unit-photon possesses the smallest amount of conserved force-energy where it has the shape-like ‘Gaussian distribution symbol having both ends turned upwardly’ and, in the case of inverted unit-photon, it has shape-like ‘Gaussian distribution symbol having both ends turned downwardly’ as shown in (1) of Figure 1. Interaction of unit-photon under suitable scheme to certain medium results into its division into two equal parts (shape-like integral symbol and shape-like opposite integral symbol), which is related to one-bit of heat energy in both cases as shown in (2) and (3) of Figure 1, respectively. Each one of them can be placed along the trajectory of confined inter-state electron-dynamics in neutral state silicon atom as discussed below. The heat energy is generated when a photon of certain length even the ‘unit-photon’ is being divided under the interaction of certain medium. When a unit-photon interacts under certain angle to suitable solid medium, instead of division, it deals merged energy as shown in (4) of Figure 1, which is a bunch of compressed energy of unit-photon and
can be termed as phonon. When unit-photon interacts to certain medium, instead of dividing into two parts or transforming into merged energy, they divide into several parts or further divide the already divided two parts into more parts; they all are related to tits-bits of heat. But, in the divided unit-photon where it is converted into tits-bits, it involved the region dealing node or antinode; it yet possesses a minute element of the force due to the involvement of turned regions. Nevertheless, in the case where the arms of unit-photon neither compressed nor divided into two parts while undertaking interaction (s) to certain medium, the unit-photon divided into several parts as shown in (5) of Figure 1 and they are related to tits-bits, which purely determine the heat.

**Figure 1:** (1) The smallest entity of force-energy shape-like ‘Gaussian distribution symbol having both ends turned’ called unit-photon, division of unit-photon in shape-like (2) integral symbol and (3) opposite integral symbol, (4) merged energy of unit-photon and (5) division of unit-photon into tits-bits of heat

When photons of longer wavelengths interact to water, they raise the temperature of the water to a less degree of hotness. But, when photons of shorter wavelengths interact with water, they raise the temperature of the water to a more degree of hotness. Long-length photons carry more energy as compared to the energy of unit-photon. The heating of medium has resulted under the different sorts of photons’ interaction where element of their force is gradually diminished while dividing the regions of nodes and antinodes of different wavelengths. The heat is being absorbed and dissipated in the medium like that of water or solution where they do not work as an insulator resulting into raise the temperature. The term ‘partially propagation’ can be employed as the broken pieces of unit-photon are not completely at rest where auxiliary inertial property
of the electron is still present. Thus, broken pieces of unit-photons and overt photons dissipate their heat while propagating and travelling through inter-state electron gaps of atoms of water molecules and contained containments where, in addition to conduct heat, the medium conducts the current also. Due to this phenomenon, a body often faces the electric shock—a shock which is due to photonic current instead of electric (electronic) current.

A photon having characteristic of current, in any length, propagates through inter-state electron gaps of suitable atoms as they contain both width and length of gap within the amplitude and wavelength of that photon [24]. However, it is observable that the burst or damage of copper or steel wire in the case of halting the propagation of photons having characteristic of current was either due to distorted (out of order) inter-state electron gap(s) or exceeded density of propagating photons. The length of photon depends on the number of cycles completed at the point of start generating until the termination of the process by the certain atom executing confined inter-state electron-dynamics. If the confined inter-state electron-dynamics remain executing consistently, the generation of photons under uninterrupted cycles results into delivers forcing energy shape-like a wave as shown in (1) of Figure 2; it is also called an overt photon where the inter-state electron-dynamics for six cycles executed (three in the forward-direction and three in the reverse-direction). When that overt photon interacts to suitable medium under its certain alignment, it is converted into bits of heat energy where each unit-photon is partly divided into two-bit heat energy. When that photon interacted with medium where its angle of travelling (from the normal line) was the same as made by the certain medium at (resting) leveled ground surface, which is shown in (2) of Figure 2, that photon divided into 12-bit heat energy as shown in (3) of Figure 2. Such bits of heat energy are absorbed by the silicon atoms on their entrance through the laminated glass working again as photon energy as discussed below. However, when the interaction of that overt photon to suitable medium was at different angle, that photon converted directly into tiss-bits of heat. When that photon was interacted normally to the medium resting at leveled ground surface as shown in (4) of Figure 2, it divided into tiss-bits of heat (in (5)).
Figure 2: (1) An overt photon generated by three forward-direction cycles and three reverse-direction cycles of confined inter-state electron-dynamics, (2) interaction of overt photon to a suitable glass when an angle in space is equal to the angle of glass plane made at the leveled ground surface, (3) several bits of heat energy resulted when the incidence angle of overt photon was the same as made by the glass surface to leveled ground surface, (4) perpendicular interaction of overt photon to the horizontal surface of certain medium resting at leveled ground surface and (5) tits-bits of heat resulted on interacting their overt photon perpendicularly to the horizontal surface of certain medium resting at leveled ground surface.

As discussed in the case of Figure 1, one-bit of heat energy further divides into tits-bits of heat if it is not timely utilized. It can be deduced that an overt photon where several unit-photons combined, on dividing further under miscellaneous interactions, it converts into tits-bits of heat where they contain the scattered energy dissipating to the medium. The smallest overt photon contained at least two unit-photons. Thus, an overt photon involves minimum two nodes and two antinodes in its configuration. When one-bit heat energy doesn’t divide further under the compression of medium, it becomes the complete recipe for its accommodation along the trajectory of forward-direction cycle (or reverse-direction cycle) of electron executing confined inter-state dynamics where the shape of one-bit heat energy becomes like opposite integral symbol (or integral symbol). Connection of this two-bit heat energy at center of relaxation point of the electron executing confined inter-state electron-dynamics resulting into generation of a unit-photon shape-like 'Gaussian distribution symbol having both ends turned'.
A traveling photon of certain forcing energy is prepared under certain alignment (angle and orientation) in the space as shown in Figure 3 (a). When that travelling photon is ready to follow an isolated electron for the purpose to instate the instantaneous velocity, it results into the conversion of force-energy to merged energy where altogether element of the force is involved in gaining instantaneous velocity of that electron as shown in Figure 3 (b) where, through that gained instantaneous velocity of that electron, it strikes to solid atom resting at suitable leveled ground surface as shown in Figure 3 (c). As a result, that atom distorted at the region of contact resulting into deform because energy knots clamped certain electrons stretched non-orientationally, which is shown in Figure 3 (d). The electron rebounds as per the reaction of counterpart (solid atom) as shown in Figure 3 (e).

**Figure 3:** (a) an overt photon is in the state of interaction to the isolated electron while traveling in the space under certain orientation where it is carrying the discrete forcing energy, (b) overt photon converted into merged energy photon where element of the force is converted into instantaneous velocity, (c) under instantaneous velocity, accelerated electron impinged to the underlying certain state atom where it transferred the merged energy to the atom at the point of contact, (d) transferred energy to atom distorted it at point of contact where clamped energy knots to electrons stretched non-orientationally and (e) impinged electron rebounded under the reaction of distorting atom.
In Figure 4 (a), a top left-side electron (indicated by the colored state) of the neutral state silicon atom is considered to execute confined inter-state electron-dynamics, which undertakes dynamics under the involvement of its relevant pole(s) exerting forces first. The relevant poles forces exerted over that electron as it started the motion against its ‘recalled auxiliary moment of inertia’ and ended the motion also against its ‘recalled auxiliary moment of inertia’ where one-bit heat energy is accommodated along its configured trajectory. Under neutral state of the silicon atom, it deals electron having no contact to its rearward side. In this context, each electron of the outer ring in neutral state silicon atom undertakes confined inter-state dynamics and as per exerting forces of the relevant poles. However, here electron of the colored state of outer ring (in Figure 4a) is considered only, which transferred to nearby unfilled state for each forward-direction cycle. That electron experienced forces of relevant poles in a conserved manner where one-bit heat energy from the front-side is placed along the made trajectory as it has no contact at the bottom end to ground surface, as a result, that electron lifted from the occupied state without touching its clamped energy knot. For electrons of zeroth ring and first ring of neutral state silicon atom, they do not go for the exertion of forces because of not exposing to them, so, only the electrons of outer ring participate to execute confined inter-state electron-dynamics.

In Figure 4 (b), a transformation of heat energy to unit-photon energy is shown where, at the central point of relaxation state, one-bit heat energy accommodated along the made trajectory of the electron which ends when ‘recalled auxiliary moment of inertia’ of exerted forces ended for the first half-cycle but, at the same point, another one-bit heat energy is accommodated along the trajectory of the electron which ends when ‘recalled auxiliary moment of inertia’ of exerted forces ended for the second half-cycle. This unit-photon is the force-energy resulted from one forward-direction cycle of confined inter-state dynamics of electron where the forcing energy accommodated along the trajectory of electron was mainly due to its steady-state behavior. That electron included ‘recalled auxiliary moment of inertia’ at four points of its turning; two times, at the start, between the trajectory of steady-state behaviors and prior to come at rest. This is a complete cycle of confined inter-state dynamics of that electron in
forward-direction as shown in Figure 4 (b). At the point of starting, controlled removal of that electron from its clamped energy knot without touching, and prior to undertake steady-state behavior for first half-cycle, the energy is accommodated along the made trajectory of electron which is due to its ‘recalled auxiliary moment of inertia’.

![Diagram](image)

**Figure 4:** (a) neutral state silicon atom and targeted electron, (b) confined inter-state electron-dynamics in forward-direction cycle and (c) generation of overt photon comprised six unit-photons

The accommodated energy along the trajectory of electron where it changed the state (rest to motion or motion to rest) was mainly due to the exerting force of its ‘recalled auxiliary moment of inertia’ while the energy along the trajectory of electron in its steady-state behavior was mainly due to exerting force of one pole. The inter-state dynamics of electron of neutral state silicon atom, on completing six cycles (three in the forward-direction and three in the reverse-direction), shaped the 12-bits of heat energy shape-like a wave where six of them have the shape-like opposite integral symbol and six of them have the shape-like integral symbol as shown in Figure 4 (c). As shown in Figure 4 (c), on just occupying the new state while completing the forward-direction cycle, that electron doesn’t go out in context of downward-side as it starts undertaking of exertion of forces for the opposite tip (as compared to when started forward-direction cycle) without having any contact to that energy knot or downward-side surface and to continue the reverse-direction cycle. Under uninterrupted forward- and reverse-direction cycles, the execution of confined inter-state dynamics of electron generates the forcing energy in a connecting hump-like shape in the manner like repetition of the shape without picking and stopping the pencil at a piece of paper while drawing on it. As two-bits of heat energy is placed during the forward-direction cycle of confined inter-state
electron-dynamics. So, the two-bits of heat energy is also placed during the reverse-direction cycle of confined inter-state electron-dynamics. This is a forcing energy of travelling (propagating) photon. Because of the twice length of this resulted photon than unit-photon, it is termed as the overt photon but the smallest one. The generating forcing energy of photon when interrupted at certain point, a photon of new forcing energy starts generating. The same process takes place in many atoms which results into generate photonic current under some additional modification required for a silicon solar cell. Each cycle of confined inter-state electron-dynamics generates forcing energy of unit-photon shape-like ‘Gaussian distribution symbol having both ends turned’ where two-bit heat energy is accommodated along the made trajectory. The continuous supply of one-bit heat energy to electron will increase the length of forcing energy, hence, longer length of the overt photon is resulted. Generating forcing energy propagates to certain in-contact medium without interruption.

In the case where an electron doesn’t deal direct usage of the one-bit heat energy, the heat energy of divided tits-bits (three portions of the bit of heat energy) is accommodated along the made trajectory to form the one-bit heat energy for first half-cycle and same is the case for the second half-cycle. So, in this case, force-energy of a unit-photon generates for a forward- (or reverse-) direction cycle also. The overall shape of accommodated energy along the made trajectory for first half-cycle dynamics of electron is like integral symbol (∫). The overall shape of accommodated energy along the made trajectory for second half-cycle dynamics of electron is like opposite integral symbol. So, the accommodated energy in the two shapes of integral symbols along made trajectory of electron-dynamics is opposite to each other, which remained connected at relaxation point for each forward- (or reverse-) direction cycle resulting into the overall shape of force-energy shape-like ‘Gaussian distribution symbol having both ends turned’ as shown in Figure 5 – a unit-photon of the force-energy. The force-energy accommodated along the path made by the dynamics of targeted electron while exerting forces of relevant poles in the forward-direction cycle is shown in Figure 5 (a); (1) to (6). The force-energy accommodation along the path made by the dynamics of
targeted electron while exerting forces of relevant poles in the reverse-direction cycle is shown in Figure 5 (b); (6) to (1).

**Figure 5:** Different regions of unit-photon generated under confined inter-state electron-dynamics of neutral state silicon atom for (a) forward-direction cycle and (b) reverse-direction cycle – dark front-side shows trajectory of electron and grey rear-side shows force-energy of the unit-photon

When all four electrons of the outer ring executed confined inter-state dynamics and the heat energy for them was available by their neutral state silicon atom, they resulted into the generation of photon energy of identical nature (and at the same rate) but by dealing the exertion of forces for relevant poles. To execute confined inter-state dynamics by each electron while undertaking the exerting forces of the relevant poles (in neutral state silicon atom) is shown in Figure 6; (a) upper left-side electron, (b) upper right-side electron, (c) lower left-side electron and (d) lower right-side electron shows the trajectory of forward- and reverse-direction cycles resulted under the exertion of forces of relevant poles while executing confined inter-state dynamics. In different confined inter-state electron-dynamics, red arrow is related to forward-direction cycle and black arrow is related to reverse-direction cycle. The heat energy is placed starting from the bottom points of those electrons, both during forward- and reverse-direction cycles, which mixes (combines) with the force (conserved) in the manner accommodating along trajectory of their executing confined inter-state dynamics resulting into generate conserved energy of generating photons also. The electron-dynamics for each outer filled state remain within inter-state gap where they remain continue to generate the conserved force-energy till maintaining the neutrality of their atom also if they remain uninterrupted. So, for each neutral state silicon atom in the lattice, forces remain conserved for relevant poles of the electrons of outer ring and in their regions of inter-state gap.
Figure 6: Electrons (blue color) dealt (exerted) forces of their different poles while executing confined inter-state dynamics in forward-direction cycle (denoted by red colored turning symbol) and in reverse-direction cycle (denoted by black colored turning symbol) as shown in their respective trajectories (a-d); forces exerting (and controlling the motion while turning) to each electron for six points are labelled along with the generated force-energy of each unit-photon under confined inter-state dynamics.

The regions of electron where ‘recalled auxiliary moment of inertia’ contributed are responsible to force the energy from one point to another point. Therefore, at each point of turning electron, a ‘recalled auxiliary moment of inertia’ is involved where it doesn’t have contact to either of the state for each cycle of forward-direction or reverse-
direction. Thus, the exerting force to different poles of that electron (of neutral state silicon atom) has remained path-independent while executing its confined inter-state dynamics. Electron doesn’t reveal any other process regarding it re-gaining of state. The forces exerting to execute electron-dynamics in forward-direction cycle and reverse-direction cycle are opposite in describing their poles. The motion to rest and rest to motion of the electron at the central point of relaxation state is due to the just stop exertion of forces at that point but it is turning toward unfilled state due to the just start exertion of forces (to the opposite sides) from that point. At each ‘recalled auxiliary moment of inertia’ of electron, two equal and opposite poles forces act together, which cause that electron to turn, so, there is coupling in the generation of force-energy of its first half-cycle dynamics and second half-cycle dynamics. The ‘recalled auxiliary moment of inertia’ is legible during steady-state behavior of the electron where exerting force onto electron is mainly because of the one pole.

In the solar panel, each silicon cell connected in the series adds up the generating number of photons having characteristic of current by neutral state atoms under certain fabrication procedure. The supplied energy in the form of one-bit heat energy may straight-forwardly be accommodated along made trajectories of electrons executing their confined inter-state dynamics. The heat dissipation at the rear-side surface of solar cell is controlled by using the silver paste or through other means and the generating photons having characteristic of current are collected from the front-side surface, facing the sunlight, while being embedded in the laminated panels. As observed in solar panel, at certain angle with respect to the plane oriented to south will result into generation of maximum average of power throughout the year where silicon atoms utilize several bits of heat energy directly, on the division under the interaction of light (photons) to glass sheet, resulting into generation of the bonus power. Therefore, in solar panels, the probability of electrons to exert forces of relevant poles under confined inter-state dynamics becomes higher in more atoms resulting into the generation of long-length photons under uninterrupted cycles of inter-state electron-dynamics, thus, an effective generation of photonic current is resulted. The cycles of confined inter-state electron-dynamics of silicon atoms are non-stop for longer period where on titling silicon solar
panel at certain orientation with respect to base results into varying the efficiency which is quite effective in the peak hours of sunlight. When the atoms are not undertaking neutral state even if the sun is at peak, the power generation of solar panel may be less. Depositing few layered ordered structures of silicon atoms at a suitable substrate, may solve the purpose of availing high-power outcome, in place of depositing several microns thick layer of silicon atoms. Employing various dopants and diffusing elements in the fabrication process of silicon solar cells work to attain neutral behavior of their atoms into maximum number.

The enhanced field emission characteristic of ‘tiny grains carbon films’ was due to graphitic state (phase) tiny grains [21]; atoms of graphitic state naturally elongated along east-west poles under the exerting forces along opposite poles at their centers where uniform inter-state electron gap enables their enhanced field emission. Photonic current propagates through inter-state electron gaps [24]. Atoms of different elements deal gas or solid state depending on the mode of exerting natural forces where they self-control their nature under certain force-energy relationship and for their different transition states [25]. Atoms of suitable elements undertake binding to evolve their different structures under confined inter-state electron-dynamics [26]. Again, the phenomena of surface enhanced Raman scattering and localized surface Raman spectroscopy of metallic nanoparticles and particles are discussed elsewhere [28]. It appears as those phenomena were because of the enhanced propagation of photonic current through inter-state electron gaps of atoms embedded at the single point of tip of those nanoparticles and particles.

Distribution of heat energy to disordered structure is in an irregular manner. More heat is resulted in structure where atoms are randomly distributed as photons having characteristic of current are divided into tits-bits of heat rather than propagating through inter-state electron gaps of embedded atoms in the ordered lattice. The collapsed photons in tits-bits of heat can again transform into bits of heat energy, thus, working under trajectory of confined inter-state electron-dynamics of neutral state silicon atom. When photons of different energy disrupt the medium (overt photons), they dissipate heat energy in the form of tits-bits. Photons assign different roles to matter on its
conversion from one form of energy to another depending on the structural motifs and individual nature of constituted atoms. In Bragg’s diffraction, amorphous materials don’t reveal any specific structure under the interaction of photons having wavelength in X-rays where energy of photons mainly converted into heat rather than being visualized in the XRD scan. In some cases, photons characteristic current is utilized to split the matter like inert gas atoms and their electrons streams are utilized to deform or elongate underlying atoms of electron transitions and, where length of photons is enough along with their configured population, they reveal the light glow while reaching wavelength to visible range [24].

In the stone’s age, catching fire was discovered while striking an embedded stone to another stone under the intensive acceleration where the captured fluke energy at their point of contact converted into forcing energy as a result of which the increasing wavelength of that forcing energy (to visible range) in the air medium revealed the glow of light but many of the photons of forcing energy transformed into tits-bits along with those which decreased energy resulting into produce heat as well. The set modalities of all sorts of photons depend on the origin of their generation establishing roles set by the manufacturer, when they deal to suitable matter. In this context, structural design is crucial in targeting their specific application and many studies are now targeting and exploring structure which standalone as well as in relation to other fields of science [29-38]. However, it has been disclosed elsewhere under original line of experiments that all structural motifs of various metallic colloids are owing to a certain level-controlled force and energy [18]. The nearly same concept is being involved when the semi-metallic materials are investigated [21, 39].

On interrupting a wave generating at a point of source under confined inter-state electron-dynamics of a suitable atom, it has resulted into release the long-length photon called overt photon. On dealing this overt photon to appropriate medium under certain angle to certain inclined ground surface, it converts into bits of heat energy following by its conversion into tits-bits of heat. In the forcing energy of travelling photon, element of the force transported energy from one location to another. However, energy can’t be forced to impose the force as the force is functioning from a distance. In a photon
energy, energy is being shielded on the force through the mechanism of confined inter-state electron-dynamics of neutral state silicon atom. As said, a photon is an entity of force-energy where the energy is being forced from one point to another. All types of travelling photons are related to forcing energy and they use space either for propagation or for travelling; in propagation, they secure an almost entire energy but while travelling, they dissipate energy by flourishing many remarkable applications.

A photon, a travelling photon and a travelled photon are related to force-energy, forcing energy and forced energy, respectively. A propagating photon through the inter-state electron gaps is still a force-energy. There are other shapes of photons as well. In atoms of those elements where four conservative forces are involved, they transform heat energy into photon energy shape-like a wave under certain condition of their processing. In the atoms of those elements where three conservative forces are involved, they transform heat energy into photon energy shape-like connected integral symbols. In the atoms of those elements where two conservative forces are involved, they transform heat energy into photon energy shape-like connected tick symbols. In the atoms of those elements where nearly two conservative forces are involved in such a manner that dynamics of electron at target doesn’t cross entire north-pole of its atom, they transform heat energy into photon energy shape-like connected ‘L’ symbols under continuous cycles. Such shapes of energy also work to bind atoms [26]. So, there are not only photons of shape-like a wave but also of shape-like connected integral symbols, connected tick symbols and connected L symbols as shown in Figure 7 (a-c).

![Figure 7: An overt photon of connected (a) integral symbols, (b) tick symbols and (c) L-like symbols](image)

It is believed that due to such featured energy photons, tiny-sized particles are used for nanomedicine applications, for example, in the case of stent application [40]. This is because, photons shape-like a wave possess their force-energy in the wavelength of
current propagating through inter-state electron gaps of atoms of suitable wire where they possess the high power, then, it is not possible to consider and plan them as the candidate of nanomedicine application and other similar sort of applications functioning inside the patient’s body. So, for many applications including the nanomedicine ones, the requirement of featured photon energy is other than the ones in a wave-like shape. For nanomedicine applications, the generated photons by the atoms of nanoparticles can include the shape(s) as shown in Figure 7 (a-c). A recent study expressed the implication of tiny-sized particles comprising certain nature atoms while using them as nanomedicine [40]. One recent study shows the developing particles of predictor packing where force and energy worked together in a certain manner [41]. To measure temperature of such materials is an integral part to understand science of their different behaviours and some of the studies shed light on it as well [42-44]. It is possible to measure temperature of atoms at nanoscale as well as at bulk scale without the involvement of thermocouples and various gadgets. What is required to determine is the probability of electrons exerting forces of poles under confined inter-state dynamics and accommodating energy along their trajectories while remaining inside their atoms. A recent study explained the role of van der Waals interactions in the case of isolated atom by considering the induced dipoles [45] which can be attained when fluctuations of charge density are in wave-like nature [46].

When it is said that an electron is spoiled, it doesn’t mean that atom is ionized, but it means that clamped energy knot to that electron is permanently stretched where its atom is being started eroding. In the case of photon, it doesn’t have mass and it involves only discrete energy which is forced from one point to another. In this context, overt photons neither impinged nor stretched and they don’t even strike, they interact to certain medium where their forcing energy is dissipated in the form of bits of heat energy (and tits-bits of heat). While propagating in inter-state electron gap, they govern many applications in addition to work only as photonic current. The nature of photon itself is signified as the energy reveals different behavior. Photons wavelength in visible range enable resolution of the image down to 0.2 mm. Photons energy in the wavelength of X-rays propagate through human body and identify the site of fracture.
Photons characteristic current propagate in a suitable wire; thus, it is a photonic current. Different cameras and devices manipulate the image on screening the reflected photons of certain pace at the surface of an object. Structure of certain materials deliver straightforward application on dealing heat or photon, for example, solutions of various metallic colloids and quantum dots.

3. Conclusions
Heat energy engaging (absorbing) by a neutral state silicon atom mixes to element of the force while accommodating along the trajectory of electron executing confined inter-state dynamics. A force-energy (photon) generated through confined inter-state electron-dynamics of a silicon atom is related to a unit-photon (shape-like ‘Gaussian distribution symbol having both ends turned’) for any cycle, forward or reverse. A confined inter-state electron-dynamics of silicon atom can generate force-energy of immeasurable length, in a wave-like fashion, if the heat energy for forward and reverse cycles is available. The mechanism of transformation of heat energy into photon energy by a silicon atom validates that atoms of different elements are in the shapes of elliptical discs having distribution of their electrons to different quadrants from the center as per availed filled and unfilled states along with number of rings.

A force different to the one exerting at each point (region) of the electron to change its aspect in forward and reverse cycles (of inter-state gap) remains along the bottom tip of that electron to mix (take) around the heat energy, this is how a photon is developed. Under inter-state dynamics of the electron, its potential energy becomes conserved for each point (region) of exerting (dealing) force where it also becomes fragile instead of dealing semi-solid behavior.

The electron of inter-state dynamics deals forces of relevant poles where exertion of the force for each pole involves a moment of inertia because of its turning but in the auxiliary manner as it doesn’t make any contact to its clamped energy knot. In reverse-direction cycle, the description of exerting forces to relevant poles of the electron is opposite to forward-direction cycle. Conservative forces are involved to execute dynamics of certain electrons (for uninterrupted cycles) of silicon atom where generating
photons deal a photonic current as they possess the characteristic of current. However, depending on the nature of electron-dynamics, atoms of different elements generate photons of different features having the shapes other than a wave-like. At one side, an atom transformed heat energy into photon energy where it deals propagation in inter-state electron gap or travels in the air medium. On other side, photon energy converts into heat energy again under certain interaction to suitable medium. When a photon interacts to certain medium, it divides into bits of heat energy following by further division into tits-bits of heat. A unit-photon involves two-bits of heat energy and an overt photon is a long-length photon, which involves at least two unit-photons. In this case, it is the smallest overt photons.

A photon has strong analogy to electron in a manner that it propagates in the inter-state electron gap working as a photonic current where it originates all sorts of applications related to force, energy, forced energy, forcing energy and force-energy at terminal end depending on the input source and mode of the operating-machine. A travelling photon is an entity transporting the energy from one end to the other end through its installed element of the force, where perhaps it increases the wavelength. A photon is carried by the electron to deal interaction or it directly interacts to matter. Contrary to this, an electron is a matter, the smallest entity of matter forming atoms of different elements where it works within its natural confinement transforming heat energy into photon energy by remaining the part of its atom under absolute respect. When an isolated stationary electron is directed by a certain overt photon to impinge to certain solid atom, its forcing energy first converted into merged energy enabling the impingement of that electron under attained instantaneous velocity where transferring the transported energy to disturb that atom in a different manner. Clearly, electrons occupy space, possess mass and impinge (or strike) under certain conditions. Photon is a processed entity of tits-bits of heat where element of the force is involved by the virtue of confined inter-state electron-dynamics of its atom. Thus, heat and photon energy are not the ones impinging, distorting, dealing forces of poles, elongating or deforming.
References:


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Mubarak Ali graduated from University of the Punjab with B.Sc. (Phys & Maths) in 1996 and M.Sc. Materials Science with distinction at Bahauddin Zakariya University, Multan, Pakistan (1998); thesis work completed at Quaid-i-Azam University Islamabad. He gained Ph.D. in Mechanical Engineering from Universiti Teknologi Malaysia under the award of Malaysian Technical Cooperation Programme (MTCP; 2004-07) and postdoc in advanced surface technologies at Istanbul Technical University under the foreign fellowship of The Scientific and Technological Research Council of Turkey (TÜBİTAK; 2010). He completed another postdoc in the field of nanotechnology at Tamkang University Taipei (2013-2014) sponsored by National Science Council now M/o Science and Technology, Taiwan (R.O.C.). Presently, he is working as Assistant Professor on tenure track at COMSATS University Islamabad (previously known as COMSATS Institute of Information Technology), Islamabad, Pakistan (since May 2008) and prior to that worked as assistant director/deputy director at M/o Science & Technology (Pakistan Council of Renewable Energy Technologies, Islamabad; 2000-2008). He was invited by Institute for Materials Research, Tohoku University, Japan to deliver scientific talk. He gave several scientific talks in various countries. His core area of research includes materials science, physics & nanotechnology. He was also offered the merit scholarship for the PhD study by the Government of Pakistan, but he couldn’t avail. He is author of several articles available at https://scholar.google.com.pk/citations?hl=en&user=UYjvhDwAAAAJ, https://www.researchgate.net/profile/Mubarak_Ali5.