Article

Heat and Photon Energy Phenomena: Dealing with Matter at Atomic and Electronic Level

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Abstract: There is a misconception about using the terms photon and electron. When the electron of the outer ring in the silicon atom executes interstate dynamics for only one cycle, it generates force and energy for the unit photon. When the photon of suitable length interacts with the side of the laterally orientated electron of an atom, it converts into heat energy. Under the approximate angle of 90º, when a photon interacts with the tip of a laterally orientated electron, it divides into bits of energy having a shape like integral symbols. In the neutral state silicon atom, the center acts as the reference point for electrons executing interstate dynamics, and the lateral lengths of the electrons remain along the north-south poles. The energy wraps around the force, which shapes along the tracing trajectory of electron dynamics in a silicon atom. Force shapes from only those sides of the electron, which are not in the exertion of forces. In interstate dynamics, the electron of the outer ring first reaches the maximum limit point, where the one-bit energy shapes. Electron completes the second half cycle, where the one-bit energy again shapes. The unit photon has a shape like Gaussian distribution in turned ends. When there is an uninterrupted supply of heat energy to the silicon atom, electron dynamics generate the photon having a shape-like wave. Path-independent but interstate-dependent forces take over the control of an electron. That electron executes dynamics nearly at the speed of light. In confined interstate dynamics, naturally viable conservative forces exert on the position-acquiring electron. A photon can be in unending length if the electron dynamics remain uninterrupted. The changing aspect of the electron recalls the auxiliary moment of inertia at each point of turning. By executing electron dynamics, atoms under neutral states generate photons of different shapes, revealing heat and photon energy phenomena.

Keywords: Heat energy; Photon energy; Fundamental forces; Electron dynamics; Atomic-scale phenomenon; Photon-matter interaction

1.0. Introduction

Technology is achieving its climax, but a basic understanding of science still awaits. The creation of earth has benefited from heat and photon energy since its existence. Catching fire to different materials and burning various commodities are the usual phenomena under observation.

Many studies have been discussed in the literature studying the light-matter interaction, mainly covered under a phenomenon known as surface plasmons. The origin of plasmons has a long history of exploration [1-4]. A plasmon is a quantum of plasma oscillating and representing the collective oscillations of the free electron gas density.

The interaction of light or photons with matter recognizes by various terminologies, such as phonons, excitons, and plasmons. A study based on reviews discussed light-matter interaction considering the properties of polariton modes in two-dimensional materials [5]. In 1931, Frenkel proposed the concept of excitons or electron-hole pairs [6]. It deals with an excited state of the atom in a lattice traveling in a particle-like fashion without the net transfer of charge. Excitons can be formed due to photon absorption by a quantum dot [7], where the phonon is a collective excitation in the periodic arrangement of atoms or molecules.

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Various studies dealing with different developing processes involve tiny-sized particles. The tiny-sized cluster is a simple chemical compound with various essential applications in diversified areas [8]. The unique nature of nanocrystals solicits the fabrication of new materials having controlled features [9]. The likely development of nanoparticle technology is an obvious long-term benefit [10]. On successfully assembling tiny-metallic colloids in the bigger-sized particles, atoms and molecules would be treated as materials soon [11]. The investigation of the dynamics of individual nanoparticles should understand before going into rational deliberations [12].

A good understanding of the surface features of nanoparticles will help in the development of high-order materials [13]. Tiny-sized clusters possess molecule-shaped electronic and non-face-centered cubic geometric structures [14]. Geometric and distorted particles deal with different forces to amalgamate in solution [15]. It was discussed the localized dynamics of the process contribute to developing the structure of gold atoms [16-19], silver atoms [19], and carbon atoms [20, 21].

Atomic elongation in the arrays of a tiny-shaped particle has been discussed elsewhere [22]. A solid atom elongates by stretching the energy knots uniformly [23].

Sir Isaac Newton explained gravity, which mainly covers by Newtonian Physics. Sir Albert Einstein explained the theory of General Relativity. Bohr proposed that electrons move around the nucleus in allocated orbits, where they have fixed energy in the ground state. Generally, the discussions on the orbits and shells largely remained to describe the electronic structure of different element atoms. The description of atomic structure by quantum states also exists.

However, such studies kept the researchers far from thinking about different atomic behaviors. The efforts put forth towards exploring fundamental science remained under less intention.

A recent study discussed atomic structure differently from all previously discussed [24].

Under conservative forces, a study discussed the fundamental aspects of structural evolutions [25].

Fundamental aspects of binding different state carbon atoms have been discussed elsewhere [26].

The interaction of the photon with the occupied energy knot electron is studied here. The electron dynamics of a silicon atom convert the heat energy into photons is discussed here. Here, the matter at the atomic and electronic levels, which reveals the phenomena of heat and photon energy, is also discussed.

2.0. . Experimental details

This work does not contain specific experimental detail. However, all those studies studying the photon-matter interaction, light-matter interaction, relation between electron and photon, heat energy, photon energy, fundamental forces, renewable energy, photovoltaics, bandgap, semiconductors, energy science, energy application, energy materials, physics and chemistry of materials may refer this study.

3.0. Results and discussion

Different interactions undertaken by nanoparticles or particles can deform their atoms [15]. A uniform elongation behavior of atomic arrays in gold atoms was discussed in a separate study [22]. A photonic current is because of the propagation of featured photons rather than the flow of electrons or charged particles [23]. However, electrons of the suitable atoms can transform heat energy into photon energy when executing the confined interstate dynamics. Thus, the photonic current is due to the propagation of featured photons through a suitable medium. The force and energy directly relate to each other when solid atoms undertake transition states [24].

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Different ground points of atoms executing the confined interstate electron dynamics are discussed [25]. Carbon atoms involve energy, whereas engaging force [26].

Atoms of those elements, which generate the photons, need energy. Therefore, atoms of suitable elements can execute the confined interstate electron dynamics to generate the photons. The photons shape like waves and can transport from the generation point to the consumption end. Such photons can diffract when they interact with the sides of electrons in solid atoms. Such photons can also reflect when they interact with the tips of electrons by forming certain angles.

3.1. *Heat energy phenomenon*

By dissipating the heat in the air medium, photons travel in the air medium rather than propagating through the interstate electron gap. A long-length photon carries more energy than a short-length photon. Both short and long-length photons can relate to overt photons. However, a very long-length or an unending length photon is only a photon. When a photon dismantles into bits of energy under suitable interaction, it does not keep nodes and antinodes. Therefore, the heat of the dismantled photon should dissipate, and the force of the dismantled photon should permeate the connected medium.

In a silicon atom, the execution of electron dynamics for one forward or reverse-direction cycle generates the unit photon. Thus, the unit photon has the length of minimum conserved force and energy. Label (1) in Figure 1 shows the minimum length photon. That photon is like the Gaussian distribution of upwardly turned ends.

The inverted unit photon having a shape like Gaussian distribution with downwardly turned ends is also shown in the label (1) of Figure 1.

When the unit photon interacts with an electron at a suitable angle, it divides into two equal parts. Each integral symbol relates to one bit of energy, as shown in labels (2) and (3) of Figure 1.

When a unit photon interacts with the electron of hypothesized solid atom at suitable incidence, the folded energy shaped like a fish can result as labeled by (4) in Figure 1. The folded energy of a unit photon is a bunch of merged energy.

A unit photon converts into many pieces when interacting with the electron's side of the hypothesized solid atom. Broken pieces of the unit photons relate to heat energy, as labeled by (5) in Figure 1.

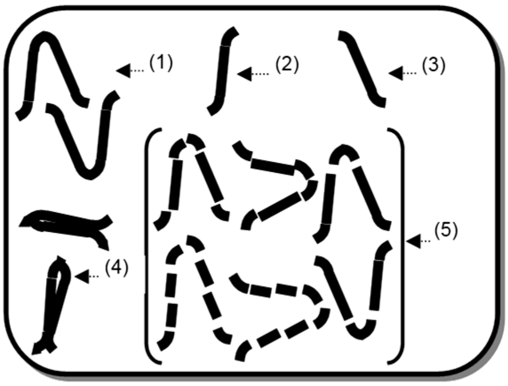

Figure 1. (1) Unit photons shape like Gaussian distribution having turned ends, (2) division of unit photon in shape like integral symbol and (3) division of unit photon in shape like opposite integral symbol, (4) merged energy of unit photons and (5) division of unit photons into the pieces of heat energy.

If the changing interstate aspect of an electron is executing uninterruptedly, then photon generation is also with unending length. A wave-shaped photon is labeled by (1) in Figure 2. That overt photon was generated by the three forward and reverse direction cycles of the electron of the silicon atom.

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When a photon interacts with the side of the electron of the hypothesized solid atom at a suitable incidence, it folds by the impact of absorption. Label (2) in Figure 2 indicates the incidence. That photon converts into many bits of heat energy. Label (3) in Figure 2 shows many bits of heat. They are now related to only heat energy.

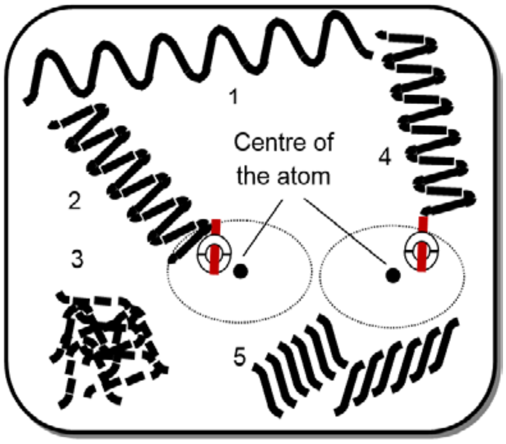

Figure 2. (1) overt photon, (2) interaction of an overt photon with the side of laterally orientated electron of hypothesized solid atom, (3) bits of heat, (4) interaction of an overt photon with the tip of laterally orientated electron of hypothesized solid atom and (5) bits of energy.

By constructing the approximate angle of 90°, the photon interacts with the tip of the laterally orientated electron of the hypothesized solid atom, dividing it into bits of energy. Label (4) in Figure 2 shows the incidence.

Label (5) in Figure 2 shows many bits of energy having shapes like integral symbols. Bits of heat can also relate to bits of energy.

3.2. *Photon energy phenomenon*

In silicon atoms, the orientation of the electrons remains along the north-south poles by keeping half-lengths above the middle of occupied energy knots and half-lengths below [24, 25]. Therefore, electrons deal with equal force along the east and west poles.

Hence, electrons of the outer ring deal with neutral force. The heat energy can initiate the interstate dynamics of the suitable electrons to convert into photon energy.

The forces exerted on the relevant poles of the electron introduce a moment of inertia, which is in an auxiliary manner at each point of turning that electron. When the suitable electron of the silicon atom executes dynamics for the first half-cycle, the energy of one bit engages along the tracing trajectory.

The energy of one bit also engages along the tracing trajectory of the electron in the second half-cycle. In a silicon atom, electrons of the zeroth ring and the first ring do not execute dynamics.

Due to exerting all four forces on the electrons, only the electrons of the outer ring execute interstate dynamics.

In Figure 3 (a), a top left-sided electron of a silicon atom executes interstate dynamics. Figure 3 (b) shows the conversion of heat energy into photon energy for the forwarding direction cycle of electron dynamics.

At the maximum limit point, the energy of one bit engages along the traced trajectory.

The energy of one bit wraps the force shaping along the tracing trajectory of the electron in the first half cycle.

The trajectory forming by the electron for the first half cycle is up to the maximum limit point, as shown in Figure 3 (b). The turning of electrons deals with the auxiliary moment of inertia.

In the second half cycle, another energy of one bit engages along the tracing trajectory of an electron to wrap the shaping force.

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The tracing trajectory by the electron in the second half cycle is from the maximum limit point. The electron again deals with the auxiliary moment of inertia. Thus, a unit photon is due to the force and energy generated from one complete forward direction cycle of interstate electron dynamics. That electron recalls the moment of inertia at each point of turning, which is in an auxiliary manner. Figure 3 (b) shows a complete forward direction cycle of confined interstate dynamics of the electron.

The turning positions of the electron under the auxiliary moment of inertia are responsible for forcing the energy of a photon from one point to another. The exerted forces on the electron remain path-independent. Figure 3 (b) validates that the electron executing confined interstate dynamics does not possess any other way to regain the state.

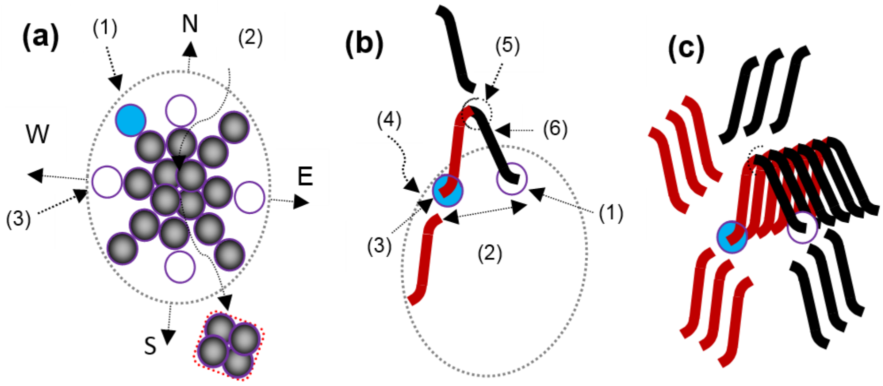

Figure 3. (a) Neutral-state silicon atom: (1) targeted electron; (2) zeroth ring; (3) unfilled energy knot. (b) Electron dynamics of silicon atom in the forward direction cycle: (1) unfilled state; (2) interstate electron gap; (3) filled state; (4) one-bit energy wrapping around the shaping force along the trajectory of an electron in first half cycle; (5) maximum limit point; (6) one-bit energy is wrapping around the shaping force along the trajectory of an electron in the second half cycle. (c) Three forward direction cycles and three reverse direction cycles of interstate electron dynamics utilizing the energy of twelve bits to generate the overt photon having a length equal to the lengths of unit photons in six.

When the interstate electron dynamics of the silicon atom complete six cycles, three forward and three reverse directions, the energy of twelve bits forms a wave shape.

Figure 3 (c) shows the different shapes of energy bits. The electron does not touch the energy knot in the forward or reverse direction cycle.

Hence, under uninterrupted forward and reverse cycles, the execution of confined interstate electron dynamics generates the force and energy in the form of an overt photon.

The shape of energy engaged along the trajectory of electron dynamics for the first half cycle is like a straight integral symbol (⨍).

The shape of energy engaged along the trajectory of electron dynamics for the second half cycle is like the opposite integral symbol (ʅ).

For the first-half forward and the second-half forward cycles of electron dynamics, two shapes of integral symbols connect at the center of the maximum limit point resulting in the overall shape of force and energy shaped like Gaussian distribution in the turned ends, shown in Figure 4.

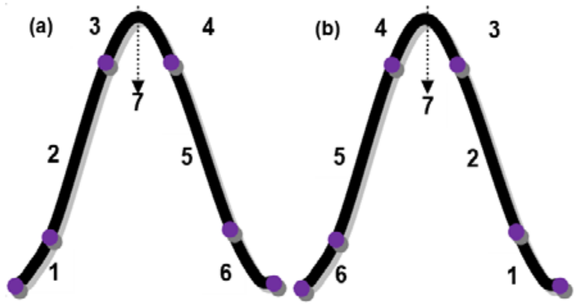

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Figure 4. Sections of the unit photon generated by interstate electron dynamics of silicon atom (a) in forwarding direction cycle and (b) in reverse direction cycle; (7) maximum limit point where left and right half cycles of electron dynamics get connected.

Figure 4 (a) plots the relationship between force and energy in the forward direction cycle of the electron. Labels (1) to (6) denote different steps in Figure 4 (a). Figure 4 (b) shows the reverse direction cycle of the electron and the relationship between force and energy. Labels 1, 2, 3, 4, 5, and 6 also show the different steps in Figure 4 (b). In Figure 4, label (7) denotes the maximum limit point.

From that point, that electron turns towards the nearby unfilled state to occupy it due to the appearance of the exerted force. Therefore, by recalling the moment of inertia in an auxiliary manner, that electron deals with the following exerting forces. Forces of two poles act together but from opposite sides, which causes that electron to turn.

In Figure 5, electrons of four quadrants trace the trajectories of confined inter-state dynamics in both forward and reverse direction cycles.

Figure 5 (a) shows that an electron leaves the state from the rear side or tail and enters the nearby state from the front side or head while executing forward interstate dynamics. So, it will leave the state from the rear side or tail and enters the nearby state from the front side or head while executing reverse interstate dynamics.

The electron in Figure 5 (b) oppositely executes dynamics to keep the equilibrium state of the atom.

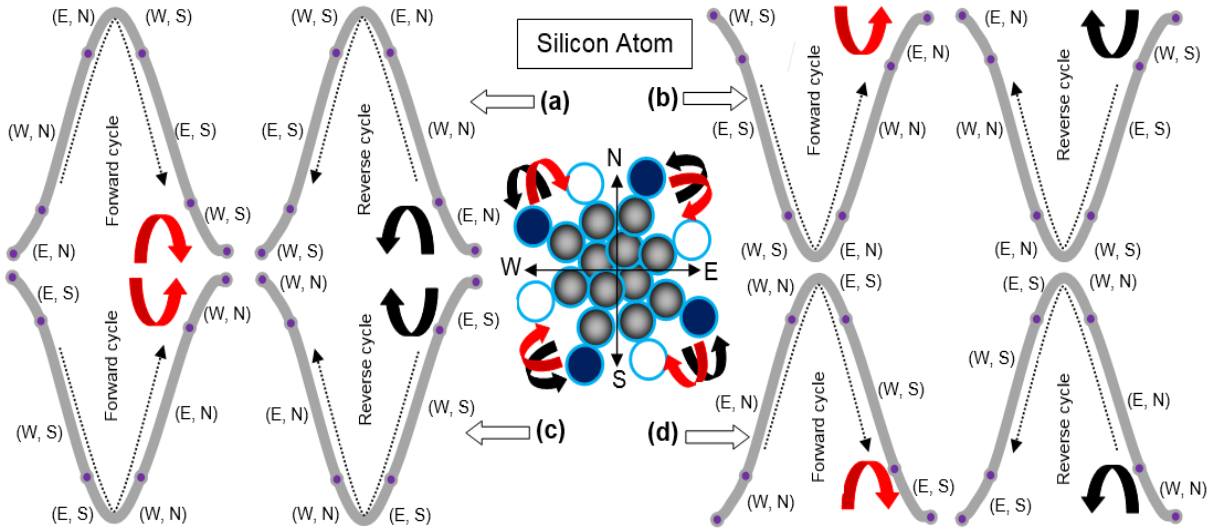

Figure 5. Electrons of four quadrants denoted by (a), (b), (c), and (d) deal with the east (E), west (W), north (N), and south (S) forces along the relevant poles while executing confined inter-state dynamics in forward (red-colored round arrows) and reverse (black colored round arrows) direction cycles.

In Figure 5 (c), an electron leaves the state from the front side or head and enters the nearby state from the rear side or tail while executing forward interstate dynamics. So, it will leave the state from the front side or head and enters the nearby state from the rear side or tail while executing reverse interstate dynamics.

Figure 5 (d) shows that the electron oppositely executes dynamics under the equilibrium state of an atom.

In Figure 5, the electrons can also execute the dynamics in reverse order. Forward and reverse cycles of electron dynamics in all four quadrants of the silicon atom are symbolically shown in Figure 5 (a-d). The pair of forces exerted on the electron at each turning point is also labeled in Figure 5 (a-d).

In the atoms where three conservative forces exert on the electron, interstate electron dynamics transform heat energy into photon energy shape like connected integral symbols.

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In the atoms of those elements where two conservative forces exert, interstate electron dynamics transform heat energy into photon energy having a shape like connected tick symbols.

In the atoms of those elements where two conservative forces exert, and an electron under dynamics attempted to cross the pole of its atom, heat energy converts into photon energy, having a shape like a connected *L* alphabet.

Figure 6 (a-c) shows the shape of the photon-like connected integral symbols, tick symbols, and *L*-like symbols, respectively. In Figure 6 (d), a generating photon shows both force and energy.

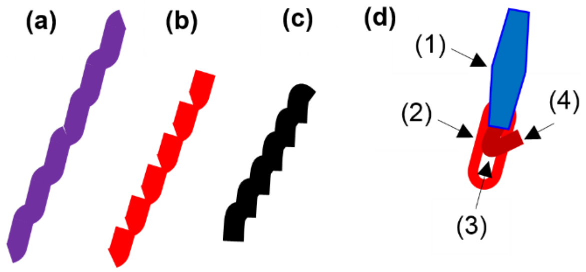

Figure 6. Overt photon of connected (a) integral symbols, (b) tick symbols, (c) L-like symbols, and (d) shaping force and energy along the trajectory; (1) electron dynamics, (2) wrapped energy, (3) shaped force, (4) force in the removed region of energy.

Where there is no specific interaction of a photon with the electron, it divides into pieces of heat energy. The heat energy of a divided photon dissipates in the structure of atoms. The conversion of energy from one form to another depends on structural characteristics.

3.3. . General Discussion

Each silicon cell connected in the series adds up to the generating number of photons under a suitable fabrication procedure in the solar panel. As observed in solar panels, solar cells can generate maximum power when the setting is under the proper inclination.

The cycles of confined interstate electron dynamics of silicon atoms remain uninterrupted for a more extended period, where titling the solar panel at a suitable angle concerning the base results in varying efficiency. Depositing silicon atoms for a few layers can generate high power.

When the featured photons interacted with the tips of laterally orientated electrons of elongated atoms, the reverted element of force prints the pattern [27]. The set modalities of photons depend on the origin of generation establishing the role set by the manufacturer. A structural design is crucial to introduce the specific application [28-37]. A structural shape is due to the controlled behavior of force and energy [17], which is a different case from the structure of semisolid atoms [20, 38].

The development of particles under predictor packing is also studied, where photons shaped like waves get converted into tuned pulses [39]. Measuring the temperature of such materials is an integral part of the research, and some studies have also shed light on it [40-42]. A study explained the role of van der Waals interactions in the isolated atoms by considering the induced dipoles [43]. Dispersion forces or van der Waals interactions attain when charge density fluctuations behave in a wave fashion [44].

4.0. Conclusion

In a silicon atom, heat energy wraps around the shaping force along the trajectory of an electron executing interstate dynamics.

A force shapes from the sides of an electron, which are not under the force exertion. When the interstate electron dynamics is for one forward or one reverse direction cycle, it generates a unit photon having a shape like Gaussian distribution with turned ends. A silicon atom transforms heat energy into photon energy in interstate electron dynamics.

A unit photon contains the energy of two bits, whereas a long-length photon has several bits. Two unit photons form the least length photon. When a photon interacts with the north-sided tip of the laterally orientated electron by constructing the approximate angle of 90°, it gets divided into bits of energy. Bits of energy can further divide into bits of heat energy.

The exerted forces on the electron change the aspects by restricting it in the interstate gap. The force shaping along the trajectory of an electron and wrapping energy remains preserved. The auxiliary moment of inertia recalls at each point of turning electron. In a silicon atom, a reference point of the electrons executing dynamics is the center of an atom.

The forces exerting on the electron remain conserved within the built-in gauge of interstate electron dynamics. Before crossing the maximum limit point, the electron examines by the opposite forces pulling it downward.

In the first stage, an electron uplifts laterally. To turn it back, it gets relief from the effect of upward force. So, to turn downward, opposite forces are exerted on the electron. Path-independent conservative forces exerted on the electron acquiring its lateral and adjacent positions are within the natural viability. The electron executes interstate dynamics at the speed of light.

Electrons of the suitable state atomic structures form a bandgap where featured photons propagate to define the photonic band gap. In the propagation of photons, force energy transfers from the input point to the consumption end.

When a photon interacts with the side of the electron of a solid atom, it diffracts, dividing into bits. Energy bits of the dismantled photon dissipate the heat and permeate the force.

Different atoms generate different shape photons depending on the built-in interstate gap of electron dynamics. So, suitable element atoms can generate photons other than a waveform depending on their built-in interstate electron gap. Such investigations open up new horizons of energy science and materials science.

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