Why Atoms of Some Elements are in Gas State and Some in Solid State, but Carbon Works on Either Side

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Abstract –To understand atomic nature and in relation to each other is the sharpness of developing sustainable science behind technological important materials. Atoms of some elements deal gas behavior and remain flying under the minimum potential energy of their electrons where clamping energy knots deal the maximum contraction. Here, electrons remain hold in gas atoms by exerting the maximum levitational force downward to upper sides of their clamped energy knots. Atoms of some elements deal solid behavior and remain grounded under the maximum potential energy of their electrons where clamping energy knots deal the maximum expansion, also. Here, electrons remain hold in solid atom by exerting the maximum gravitational force downward to lower sides of their clamped energy knots. In gas atoms, lengths of their electrons remain more than half, from the centers of their clamped energy knots, on upward sides toward north-pole. When the gas atoms deal transition in recovery state, electrons dislodge hold from upper sides of their clamped energy knots; in neutral state, electrons remain pause having no contact to their clamped energy knots; in re-crystallization state, electrons start tapping to lower sides of their clamped energy knots; in liquid state, electrons tap to lower sides of their clamped energy knots at faster rate where they are nearly placed along the force of ground surface, from the above side. In solid atoms, lengths of electrons remain more than half, from the centers of their clamping energy knots, on downward sides toward south-pole. When the solid atoms deal transition in recovery state, electrons dislodge hold from lower sides of their clamped energy knots; in neutral state, electrons remain pause having no contact to their clamped energy knots; in re-crystallization state, electrons start tapping to upper sides of their clamped energy knots; in liquid state, electrons tap to upper sides of their
clamped energy knots at faster rate where they are nearly placed along the force of ground surface but from the below side. When equal number of electrons remains above and below the line of east west poles of the atom along with equal number of electrons at left-right sides of north-south poles, its certain electron can work neutral where it neither taps to clamping energy knot nor is held by it, for example, a silicon atom. A carbon atom rotates state under the transfer of electrons at necessitating energy to nearby unfilled states, thus, maintains ground point either at above ground surface, at ground surface or at below ground surface resulting into occupy either gas state, ground state or solid state, respectively. Excluding hydrogen atom, it appears that all atoms possess the same number of electrons as prescribed for them where addition of two more refers to zeroth ring, which is related to helium atom, thus, none of the atom has prescribed protons and neutrons. This fundamental revolution describing the origin of different nature of atoms along with their transition states under inter-changeable force-energy behaviors may shed new light in developing tangible science behind technologically important materials.

**Keywords:** Atomic structure. Atomic behavior; Force and energy; Contraction and expansion; Potential energy of electron; Nature and environment

1. **Introduction**

The Periodic Table provides the position of elements in the form of rows and columns by referring the characteristics of their atoms; atomic and mass number, valence number, electronic configuration, atomic radius, electronegativity, shielding effect, etc. The Periodic Table also provides the information of filled and unfilled states of electrons from where valency of an atom can be depicted. Lattice of carbon atom along with its different states is discussed elsewhere [1]. All those solid atoms which execute transitions of electrons, they elongate under certain transition state when dealing the appropriate level of ground surface [2]. The development mechanism of various tiny particles has been discussed elsewhere [3] where different transition states of gold atoms are to be observed. Gold atoms in monolayer assembly when they deal certain transition state at solution surface at the same instant placing packets of nano shape
energy, they result into convert them in triangular-shaped tiny particles [4]; one-dimensional arrays of atoms elongated and converted into structure of smooth elements. Evolution of basis-structure under different uni-format force where confined electron-dynamics configured energy along their trajectories is discussed elsewhere [5]. The phenomena of heat and photon energy are discussed elsewhere [6] where silicon atom under neutral state of its electron transformed heat energy into photon energy. These studies indicate that atoms of different elements possess different electronic structures to the existing (available) ones.

Regardless of that, mercury belongs to transition metals in the Periodic Table, it neither reveals the state of solid nor the state of gas, but it behaves like liquid at normal conditions of the environment following by Bromine. Metals like cesium, gallium and rubidium remain in solid state just at room temperature and start melting just above the room temperature as per given information of the Periodic Table. This reveals crucial role of filled and unfilled states of outer ring of atoms of different elements. Again, inert gas atoms don’t show any sort of affinity with respect to surrounding ones because of filled states, thus, they don’t bind to evolve structure, and so, they split under the application of exceeded propagation of photons characteristic current [2]; this study reveals that atoms of gas state deal different behavior to solid atoms.

Under suitable concentration of gold precursor, many tiny particles developed in triangular-shaped tiny particles [7]. Morphology-structure of gold particles was controlled under varying pulse ratios and polarity has been discussed elsewhere [8]. Tiny metallic colloids under unfit packing have been discussed elsewhere [9]. Tiny metallic colloids don’t develop in triangle shape while processing AgNO₃ and binary composition of HAuCl₄ and AgNO₃ where same setup along with processing conditions were employed as in the case of HAuCl₄ only [10]. Particles of unprecedented shapes have been developed under predictor packing validating the role of different forces [11]. The use of tiny-sized particles for nanomedicine can be effective or defective because of the certain behavior of their comprised atoms, thus, demand extra measures [12]. These studies also validate the different structures of atoms belonging to various elements of Periodic Table.
Atomic structure and binding of different state carbon atoms is given elsewhere [1] where structure evolution of each state carbon atoms is pinpointed. Due to several states of carbon atom and originating several physical behaviors, it reveals different structure for each state [1], which is different to the prescribed one in the Periodic Table. As a result, testing and analyzing of deposited thin or thick carbon film is puzzled; how to deal carbon-based film thickness in sub-micron deposited on substrate recording different set of data [13]. Morphology-structure of carbon films switched at varying process conditions as discussed elsewhere [14]. Carbon atoms evolve content-specific growth of films under varying chamber pressure [15].

The prosperous assembling of colloidal matter into meaningful structure will result into deal atoms and molecules as tomorrow's materials [16] and understanding in the individual dynamics of tiny-sized particles formation is essential before enabling the assembly to useful large-sized particles [17]. Hard coatings are due to oppositely switched force-energy behaviors of gas atoms and solid atoms [18].

Sir Isaac Newton formulated laws of motion and universal gravitation; the latter involves the mathematical description of gravity. Sir Albert Einstein developed the general theory of relativity along with mass energy relationship and the principle of relativity was further explained by extending to gravitational field where concept of anti-gravity (levity) didn't incite; the general theory of relativity remained only a model to large-scale spectrum structure. Different models, like Rutherford's atomic model and Bohr's atomic model, and theories, like Yukawa theory, are available in the literature defining structure and sub-structure of the atoms.

Solid atoms which are eligible to evolve different structures under grounded format their ground points to trigger binding are at below ground surface. Solid atoms which are eligible to evolve different structures under surface format their ground points to trigger binding are at ground surface. Solid atoms which are eligible to evolve different structures under space format their ground points to trigger binding are just at above ground surface. Based on these observations, evolution of different basis-structures in solid atoms where dealing the force of all three formats under their confined electron-dynamics have been discussed elsewhere [5] which indicate a
different behavior of atoms instead of the presented ones dealing shells, orbits, band gap, fermi levels, nucleus, etc. Then, under the transfer of electron to nearby unfilled state changed the physical behavior of carbon atom as discussed elsewhere [1].

All these cited studies indicate discernible role of atoms of various elements which is appeared to be based on their physical natures. But the atomic structure of different available elements remains in focus with reference to shells and orbital configurations along with the concept of band gap. However, this is not the case in the present study. The dominant behavior of levitation or gravitation of electrons under their gained potential energy as per tickling rate to clamping energy knots in their respective atoms is the main cause of them to be in gas or solid behavior, which was not remained under discussion in the era of science.

Different shaped characteristic energies when photon energy transformed into heat energy or when heat energy transformed into photon energy have been discussed elsewhere [6]. Different shaped characteristic energies are being involved in binding atoms of certain state carbon atoms in evolving their structures as discussed elsewhere [1]. The application of those characteristic energies in evolving structures of diamond and graphite in maximum contents under varying chamber pressure of deposited carbon films have been discussed elsewhere [15].

To be in neutral state of an electron in its atom, it is required to deal only the forces of exposed faces as that electron kept hiding at least two sides where forces of relevant poles remained disappeared; the forces of exposed poles of electron remain in opposite description to the ones disappeared [6]. However, appearance and disappearance of forces along the transitional poles of electron are in the competing manner where one side keeping it away from its atom and on other side keeping here along with its atom. Certainly, the position of electron dealing neutrality to clamping energy knot in its atom is in the manner which never let it to be gone away from the atom. This was one of the reasons why it has been explained elsewhere [2] that none of the atom is ionized. The position of neutral state electron in atom along with dealing the forces in terms of appearance and disappearance is discussed elsewhere [6] resulting into configure conserved forcing energy along projecting trajectory by
transforming the non-conserved heat energy. As the shape of the electron is more like in sphere shape instead plane (square or rectangle, etc.) shape. Therefore, in the event of dealing neutrality in its atom, it is to be dealt the relevant appeared forces tangentially at each point of the exposed surfaces. This results into introduce a force factor together with the placing energy along its projecting path as per gained velocity. So, the placed energy along the inter-state working forces of that neutral state electron is termed as ‘forcing energy' because electron-dynamics is not only owing to placing energy but also because of the working forces at each point of exposed surface of that electron and the maximum extent at the points of its turning to shape energy in a wave-like fashion.

Established science of materials and their various physical phenomena solicit a combined fundamental question that how atoms of various elements behave in their function; in some cases, they are in the gas and in other cases, they are in solid. Here, atomic structure and atomic behavior of various elements in the Periodic Table is designated. This study is an attempt to explore the cause of different atoms to be in gas or solid following by their transition states. An inter-changeable force-energy paradigm is drawn where solid (or gas) atoms convert into liquid transition states and restoring their original solid (or gas) behaviors. A single electron of solid and gas atoms dealing possible transition states while in its clamping energy knot is discussed where gain or loss of potential energy as per dealing orientational force is pinpointed.

2. Results and discussion
Lattice of carbon atom is discussed elsewhere [1] where photons wavelength in current while in certain length and number when kept the common centre of their arrested inter-crossing formed the hollow regions in required number of filled and unfilled states, which are related to positions of electrons referring to their clamping energy knots. This indicates that centre of atom, belonging to any element, doesn’t involve any mass (electron). In the case, no electron is available for hollow region of energy knot, it is referred to unfilled state. Because of that, when dealing the force of surface format, clamping energy knots of electrons of certain behavior atoms are influenced in certain
manner resulting into their stretching and such atoms don’t ionize, however, atoms of inert gases split under the excess propagation of photons characteristic current [2]. Depending on the attained dynamics of atoms along with certain transition state, they develop different tiny particles as discussed elsewhere [3]. Again, when atoms assembled in monolayer assembly of certain shape, they deal elongation of atoms of one-dimensional array resulting into develop structure of smooth elements [4]. Depending on the format of force, atoms of confined electron-dynamics deal different mechanism to evolve their basis-structures [5]. Impinging electrons from the external source utilize the punched forcing energy to underlying atom of certain state where on connection the energy is being transferred to distort that atom as discussed elsewhere [6]. A carbon atom under changing the position of state in outer ring reveals discernible feature of atomic structure [1]; it goes into gas state, or nearly neutral state or solid state depending on the positions of transferred electrons in carbon atom. A carbon film evolved in discernable feature of the structure while changing the chamber pressure where the indicated different role of binding energies for each content-specific growth [15]. Oppositely worked force-energy behaviors of gas and solid atoms located their common new ground points in the level of the ground surface instead of originally kept ground points, which resulted into deposit hard coating at suitable substrate [18].

Each atom contains electrons of conserved mass clamped by sizeable energy knots shaping an overall shape like elliptical disc in most of the cases. The pair of electrons clamped by two oppositely inter-crossed arrested photons, which have the length of two connected unit-photons. In each case, their binding forms the shape-like tilted digit ‘eight’, which is related to hydrogen atom. So, net of energy knots for electrons in the case of hydrogen is different. The inter-crossing of two tilted digits ‘eight’ forms the molecular hydrogen where the numbers of electrons are equal to helium atom. But, helium atom carries four electrons under the originally built-in clamped energy knots instead of separately inter-crossed ones. Atoms of other elements, except hydrogen, deal nucleus as zeroth ring, which is, in each case, is related to helium atom. Following by the zeroth ring, atoms contain either first ring or second ring and so on. So, they depend on the prescribed number of electrons for atom of each element. However, two
more electrons are accounted to shape the zeroth ring of all atoms except hydrogen, thus, maintain symmetry in terms of experiencing forces of nature. Thus, a hydrogen atom only attends the north-south forces with negligible intervene of east-west forces. The electronic configuration of hydrogen atom and molecular hydrogen is shown in Figure 1 where intercrossed sizable unit photons clamped electrons by energy knots (black and green ones) developing a shape like tilted digit ‘eight’. For molecular hydrogen, two shapes of tilted digit ‘eight’ inter-crossed. Same is the case for helium atom where four electrons intercrossed in two tilted ‘eight’ digit forming the zeroth ring.

**Figure 1**: Atomic and molecular hydrogen (drawn in estimation)

In an atom, outer ring involves both filled and unfilled states, but, in the case of inert gas atoms, mainly filled states of the outer ring as well. In the first ring (for carbon outer ring also), the maximum eight states of electrons clamping energy knots are available. In carbon atom, central four electrons are related to zeroth ring (nucleus) following by the outer ring which comprised four filled states and four unfilled states. By rotating the position of electrons within the vacant states, a carbon atom converts into various state carbon atom. The states (hollow regions) of energy knots in the lattice of atoms related to various elements is as per prescribed number of electrons; in the first ring, second ring, third ring or even fourth ring. A lattice of carbon atom is drawn and discussed elsewhere [1] dealing both filled states and unfilled states to form its different states.

Forces of different formats are fully operational in atoms of all available elements whether they are in contact to ground surface or not. When an atom deals neutral behavior of its certain electron, it means that electron deals equal and opposite force of east-west pole at the centre along with equal level of force existing between levitation behavior and gravitation behavior, thus, that electron doesn’t enable to have contact to its clamping energy knot. That electron remains still as per gained balanced potential energy under the virtue of its dealing balanced force for that position in its atom and for that certain moment of its stay. Because, forces along all four axes of the atoms can’t
be neutral due to naturally available difference, that’s why, forces of east-west poles are by means of forces of north and south poles.

The expansion and contraction of energy knots clamped to electrons in atoms of either behavior are recoverable because of adjusting gravitation and levitation behaviors of companion ones while dealing adjustable force and as per built-in nature of each atom. However, the elongation behaviors of atoms are less pronounced in terms of their recovering as they deal the stretching of clamping energy knots of electrons on both sides from the centre under oppositely working forces of surface format [2]. Deformation behavior of an atom is related to the modified behavior of elongation where forces of opposite poles influencing at its centre are not working in uniform manner in terms of stretching clamping energy knots to its electrons. Therefore, atoms don’t elongate along north-south poles or south-north poles because, energy knots clamping their electrons in the states involve hump like shape along those poles, a crest is formed toward one side and a trough is formed toward the other (opposite) side. However, crests and troughs of inter-crossed photons forming energy knots around the state of each electron (or its unfilled state) more in the straightening (stretching) way along the east-west (or west-east) poles when their atom is elongated. This results into introduce adjacent placement of electrons clamped by stretched energy knots, side-to-side, in their atom, which is obvious in the case of bound atoms. Thus, atoms deal elongation behavior under nor or less recovery. Elongation and deformation of atoms take place under their certain transition state where elongation behavior deals orientational-based stretching and deformation behavior deals non-orientational-based stretching of energy knots clamping electron states as discussed elsewhere [2].

From those studies, it is stated that atoms behave (function) as per inherently built-in nature where their possessing centers at point of zero-force because of non-availability (no mass) of electron and due to inter-crossed net of energy knots describing the lattice of an atom. Adjacent placement of electrons along opposite poles while remaining inside stretched clamped energy knots result into elongate their atoms when their certain transition state dealing the surface format force. When the electrons having mass (length) more than half on the upward sides toward north pole, from the centers of
clamping energy knots, their atoms work for gas behavior where origin of their science is the contraction of their clamping energy knots as per decreased potential energy under maintaining their orientational levitational force. Levitation behavior of electrons while remain clamping by energy knots is in intact if they are dealing the same adjustable potential energy in favoring environment, thus, keep their atoms to be in the gas state. But, when the electrons having mass (length) more than half on the downward sides toward south pole, from the centers of their clamping energy knots, their atoms work for solid behavior where origin of their science is the expansion of their clamping energy knots as per increased potential energy under maintaining their orientational gravitational force. Gravitation behavior of electrons while remain clamping by energy knots is in intact if they are dealing the same adjustable potential energy in favoring environment, thus, keep their atoms to be in the solid state. Therefore, atoms of different nature self-control their existence where the adjustment of energy knots clamping electron states is in accordance with the originating gravitation-levitation behavior of electrons as per available force.

A suitable atom of neutral state electron configured heat energy into photon energy where retained the same wavelength as in the case of transforming heat energy into photon energy, which works for the photonic current [6]. That neutral state comes prior to re-crystallization state as shown in Figure 2. A recovery state is related to transition of certain electrons of an atom having either solid behavior or gas behavior which falls between neutral state and relevant original state of that atom. But, a re-crystallization state of atom exists between its neutral state and liquid state in both atoms of gas behavior or solid behavior. Those different transitions states, both in gas and solid atoms, possess order as shown in Figure 2. In Figure 2, a different identity sign is used for each different transition state showing the oppositeness in description when gas atom converted to liquid state and solid atom converted to liquid state. However, for neutral and liquid states, the sign remained unchanged in their identity. A recovery state of the atom is resulted when the electrons are recovered in the atom to original state behavior of that atom or when recovering the neutral state of that atom where that atom can be related to original gas behavior or solid behavior. The recovery and re-
crystallization of atoms are different transition states, one before the neutral state and
other after the neutral state where certain number of electrons deal those transitions as
per nature of the atom. Atoms of many transition metals while in monolayer tiny particle
when deal re-crystallization state at the level of ground surface, they elongate resulting
into modify their one-dimensional arrays into structure of smooth elements [4]. A neutral
state of atom can’t occupy all electrons of neutral state as it is achieved under the
involvement of companion ones.

Figure 2: Transition states of atoms under certain number of electrons; when solid atoms transition in
liquid state where followed the recovery state, neutral state and re-crystallization state and when gas
atoms transition in liquid state where followed the recovery state, neutral state and re-crystallization state

When an atom is converting from its gas behavior state to liquid behavior state, energy is gained by that atom as clamping energy knots around transition state electrons relax as per expansion under the tensing force of those electrons. So, electrons of liquid state of that atom increase their potential energy on exerting force downwardly to lower sides of the clamped energy knots and through repeated tapping. When that liquid state atom converted back into its original gas behavior state, the same amount of energy is recovered (lost) by that atom as now it is dealing the relaxing force
where they are functioning by themselves to retain original natural state under gaining the same contraction level of clamping energy knots of electrons through decreasing their potential energy. This is an interchangeable force-energy behavior while converting original gas behavior atom into its liquid state and then restoring its original state behavior as drawn for possible state conversion gas atoms in Figure 3 (a).

In contraction of gas behavior atom where it retains original ground point at above ground surface, the work done is positive where it goes to retain ground point at ground level surface while dealing liquid state. Here, electrons of the atom maintained maximum potential energy to sustain the attained liquid state under the maximum extent expansion of clamped energy knots. That liquid state atom goes back into its original gas state by releasing the same amount energy by itself under restoring the maximum limit of contraction of clamping energy knots to electrons. Here, the work done is negative. This is because that ground point of that atom was at above ground surface when in original gas behavior but releasing the energy under the conversion of original state. At this time, that atom worked by itself instead the work was done on it.

Now, when an atom is converting from its solid behavior state to liquid behavior state, energy is lost by that atom as clamping energy knots around transition state electrons tense as per contraction under the relaxing force of those electrons. So, electrons of solid state of that atom decrease their potential energy on exerting force downwardly to upper sides of the clamped energy knots and through the repeated tapping. When that liquid state atom was converted back into its original solid behavior state, the same amount of energy is recovered (gained) by that atom as now it is dealing the tensing force of those electrons where they are not functioning by themselves to retain original natural state under gaining the same expansion level of clamping energy knots of electrons through increasing their potential energy. This is again an interchangeable force-energy behavior for possible state conversion solid atoms as shown in Figure 3 (b). However, opposite in description to gas behavior atom.

In expansion of solid behavior atom where it retains original ground point at below ground surface, the work done is negative where it goes to retain ground point at ground level surface while dealing liquid state. Here, electrons of the atom maintained
minimum potential energy to sustain the attained liquid state under the maximum extent of contraction of clamped energy knots. That liquid state atom goes back into its original solid state by absorbing the same amount of energy giving to it under restoring the maximum limit of expansion of clamping energy knots to electrons. Here, the work done is positive. This is because that ground point of that atom was at below ground surface when in original solid behavior but absorbing the energy under the conversion of original state. Currently, that atom didn’t work by itself.

Figure 3: Inter-changeable force-energy paradigm when (a) gas behavior atom converted into liquid state and when restoring the state and (b) solid behavior atom converted into liquid state and when restoring the state

A generalized behavior of force-energy of atoms having ground point at above ground surface, when conversion of gas to liquid state and their restoring state occur, is shown in Figure 3 (a), which is the inter-changeable behavior of force-energy. The generalized behavior of force-energy of atoms having ground point at below ground surface, when conversion of solid to liquid state and their restoring state occur, is shown in Figure 3 (b), which is again an inter-changeable behavior of force-energy but opposite in description to inter-changeable behavior of force-energy of gas atoms conversion into liquid state and their restoring state. Atoms of certain nature elements are converted from one state to another, which is recoverable under the gain (or loss) of same amount of energy. It is observable that how fast a liquid state of different metals solidifies. Similarly, how fast the liquid state of nitrogen atoms vaporizes on opening a
reservoir tank. In fact, those are the transition states of those atoms attained under the command of certain force-energy behaviors.

In Figure 4, single electron of certain gas behavior atom shows different transition states under different actions to its clamped energy knot where different orientation of attempting gravitation behavior while each transition state is observed. In Figure 4 (a₁), single electron attempted the levitation behavior to maximum extent, which is in hold to upper sides of clamped energy knot where formed angle of the electron to normal line is ~35°, which is at left-side of north-south poles where it deals its original gas behavior. In Figure 4 (a₂), single electron is ready to be attempted under a bit levitational force where it is just dislocating from its clamped energy knot by forming an angle ~20° to normal line, which is at left-side of north-south poles where it deals the recovery state. In Figure 4 (a₃), single electron is neither in hold nor tapping and it is just in pause position having no contact to its clamped energy knot where formed an angle ~5° from the normal line and at left-side of north-south poles where it deals the neutral behavior. In Figure 4 (a₄), single electron is tapping downward to lower sides of its clamped energy knot, at slow rate, under gained levitational force by forming an angle ~35° from the normal line and at right-side of north-south poles where it deals the re-crystallization state. In Figure 4 (a₅), single electron is tapping downward to lower sides of its clamped energy knot, at fast rate, under gained levitational force by forming an angle ~50° from the normal line and at right-side of north-south poles where it deals the liquid state.

Figure 4: A single electron of a certain gas behavior atom shows different transition states; (a₁) gas state, (a₂) recovery state, (a₃) neutral state, (a₄) re-crystallization state and (a₅) liquid state

A single electron of certain solid behavior atom shows different transition states while different actions to its clamped energy knot and under different orientations of attempting gravitation behaviors is shown in Figure 5. In Figure 5 (a₁), single electron
attempted gravitation behavior under maximum expansion of its clamping energy knot while forming an angle ~35° from normal line and at left-side of north-south poles, thus, remained hold to lower sides of its clamped energy knot. In Figure 5 (a2), single electron is just ready to dislocate from its clamped energy knots under a bit gravitational force by forming by forming an angle ~20° from the normal line and at left-side of north-south poles where it deals the recovery state. In Figure 5 (a3), single electron is in pause position having no contact to its clamped energy knot where no hold no tapping to its clamping energy knot, thus, forming an angle ~5° from the normal line and at left-side of north-south poles, which is related to neutral state when its atom is related to gas behavior. In Figure 5 (a4), single electron is tapping to lower side of its clamped energy knot while exerting the gravitational force downwardly at moderate level, thus, formed an angle ~35° from the normal line and at right-side of north-south poles where it deals the re-crystallization state. In Figure 5 (a5), single electron is tapping to lower side of its clamped energy knot while exerting gravitational force downwardly at extended level where it formed angle ~50° from the normal line and at right-side of north-south poles. Thus, it deals the liquid transition state.

**Figure 5:** A single electron of certain solid behavior atom shows different transition states; (a1) solid state, (a2) recovery state, (a3) neutral state, (a4) re-crystallization state and (a5) liquid state

In Figures 4 and 5, the shape of each energy knot clamping its electron of certain orientating force having different five behaviors for both solid and gas states atoms is sketched in estimation. In none of the atom, electron doesn’t cross the north-south poles. In the elements where atoms contain equal mass of electrons above and below the central line connecting east and west sides along with equal mass at left-side and at right-side of north-south poles, they work for neutral state. Thus, when the lengths of electrons remain more than 50 % on downward sides of their clamping energy knots in
atoms of any nature, they deal solid behavior. However, when the lengths of electrons remain more than 50% on upward sides of their clamping energy knots in atoms of any nature, they deal gas behavior.

In the electrons of original gas behavior atom, their more lengths, from the centers of their clamped energy knots, remain on upward sides pointing more toward the north pole. This results into hold electrons by the upper sides of clamped energy knots, when they don’t hold by them, they tap to lower sides of their clamped energy knots by exerting the force. A single electron in certain gas behavior atom remains hold under the exerted force downward to upper sides of clamped energy knot, which is shown in Figure 6 (a); electron rarely tapped to lower sides of its clamped energy knot. In the electrons of original solid behavior atom, their more lengths, from the centers of their clamped energy knots, remain on downward sides pointing more toward the south pole. A single electron in certain solid behavior atom remains hold under the exerted force downward to lower sides of clamped energy knot, which is shown in Figure 6 (b); electron rarely tapped to upper sides of its clamped energy knot.

**Figure 6:** (a) an electron of original gas behavior holds to upper sides of its clamped energy knot where it seldom taps to lower sides of its clamped energy knot and (b) an electron of original solid behavior holds to lower sides of its clamped energy knot where it seldom taps to upper sides of its clamped energy knot.

In line with this, an increased (potential) energy of gas behavior atom when dealing certain transition state is under the tensing force of its electrons. Positive work done in gas behavior atom indicates its original ground point at above ground surface where work is being done on the atom to go into liquid state or intermediate transition state. In the tensing force where work done is on the atom of gas behavior, each electron of levitation behavior attempts forcefully the gravitation behavior and disturbing naturally
built-in tempo of that atom, thus, attaining different environment to the one when it was in the original state. However, a decreased (potential) energy of solid behavior atom when it deals certain transition state is under the relaxing force of its electrons. Negative work done in solid behavior atom indicates its original ground point at below ground surface where work is being done by the atom to go into liquid state or intermediate transition state. In the relaxing force where work done is by the atom of solid behavior, each electron of gravitation behavior attempts itself the levitation behavior and disturbing naturally built-in tempo of that atom, thus, under different environment to the one when it is in the original state.

Atoms of different groups which are enlisted in the Periodic Table deal their different behaviors registered in many ways. Different groups of atoms undertake inter-changeable force-energy behaviors at significant difference to each other. But within the same group, inter-changeable force-energy behaviors of atoms may show less significant difference with respect to each other. Atoms behave independently when are in the zone of their naturally built-in environment where they don't anticipate the transition in original state. The same is the case when the atom of certain element keeps the provision to convert into its new atomic nature under the possibility of transferring electrons to nearby unfilled state. However, when they are being dealt in the zone different than their naturally built-in environment, they deal transition of state under inter-changeable force-energy behaviors. Their transitions are always being monitored under the established conditions of their processing where obtaining size ranges nano to bulk level. And their rescued force-energy behaviors at ground surface remained blurred or have never been anticipated in their processing. The ground points of atoms belonging to different groups become different when dealing them at ground surface or at other location different to their naturally built-in environment. So, they work dependently to force-energy behaviors dealing them at that point. Therefore, it is not necessary that the atoms of certain elements deal all the discussed transitions or even their transitions at pronounced level. When force interacts to atoms available in different zones around the ground surface, they place the energy as per mode of acting of their electrons. Atom of each element and then within each possible transition state is under
the action of force, which is with reference to built-in nature of electronic configuration. The origin of the source of force remains fixed but operates as per built-in ground point of an atom, which is different in the case of each element and is being compensated by the potential energy of held electrons under the application of force in levitating-gravitating manners where their clamped energy knots safeguard. Because of which, clamped energy knots for attaining certain transition state of the atom deal contraction under the levitational force of their electrons and expansion under the gravitational force of their electrons. As the gas atoms possess already 50% mass (length) of electrons at above from the centre of clamping energy knots toward the north side where their ground points remain (stay) at above ground surface. Thus, levitation behavior of the electrons under less lost potential energy yet remains greater than potential energy resulted under their gravitation behavior even in the case of attaining liquid state of that gas behavior atom. On the other hand, gravitation behavior of the electrons under less lost potential energy yet remains greater than potential energy resulted under their levitation behavior even in the case of attaining liquid state of that solid behavior atom.

It is discussed elsewhere [1] that under the rotation of electron, from filled state to nearby unfilled state, the nature of its atom is changed. For that, it is given a different term. For example, in gas state carbon atom under the rotation of its electron, graphitic, diamond, lonsdaleite, graphene, nanotube and fullerene states are emerged, and they have completely different behavior with respect to each other. In this study, the transition of atomic state either for gas behavior or for solid behavior without the transfer of any electron from filled state to nearby unfilled state where conversion of gas atom into liquid following by liquid into gas and solid atom into liquid following by liquid into solid atom is being discussed.

Electrons are being arrested, as prescribed for atoms of each element, by the photons of least wavelength (and the highest energy) and is termed as the photonic current as discussed in references 1 and 2. The length and number inter-crossed photons (exactly) is as per given filled and unfilled states of an atom of various elements available in the Periodic Table. The arrested mass of each electron is in the size of fixing to inside inter-crossed photons. Thus, those inter-crossed photons constructed
energy knots at both sides of the filled state facing mainly east-west sides, whereas, crest and trough of those inter-crossed photons deal mainly north side and south side, respectively. It appears that the formation of atoms of various elements is in the zones of space where they are available in high density. Transportation of atoms of different elements, particularly, in the case of ones which deal gas behavior, they are under different arrested means and as per overall nature of the surrounding environment also. Atoms of various elements are formed under the availability of required lattice. Mass of electron (in required number) develop them in a certain nature suit to their naturally available environment. Here, electron doesn’t mean negative charge, but it is the smallest entity of mass which an atom possesses to design electronic configuration meant for it since the existence. Conventionally, the word ‘electron’ is being used which originate the character of an atom in all naturally available elements and with this attention, it is kept intact. Therefore, an electron is the smallest unit of discrete mass of an atom.

Atoms of grounded and space formats do not deal elongation if it remains in the zone of natural level as the energy knots clamping electron states in atoms operate in pull and push like manner while attempting the gravitation behavior and levitation behavior of their electrons, respectively. An electron, owing to occupy mass, is being monitored by the influencing force behaviors while in its atom under clamping energy knot to its state. The levitation and gravitation behaviors are quite diligent at atomic level in various elements where processing of their different materials at nano level and micro level may bring the considerable effect depending on the nature of their elements. Many phenomena of science are waiting to be dealt as origins of their sciences are at different line of presentation as compared to the existing ones.

3. Conclusions
Prescribed number of electrons in atoms of various elements belonging to Periodic Table is workable to designate their atomic structure, thus, exclude allocated number of their protons and neutrons with condition of two additional electrons to define their zeroth ring, which is termed as nucleus of all atoms other than hydrogen. Hydrogen
atom comprises only two electrons to define atomic structure. The inter-crossing of two hydrogen atoms at suitable force forms the molecular hydrogen but not like the way in helium atom, which refers zeroth ring in atoms of various elements. Electrons of the tiniest mass are remained clamped by their energy knots having dedicated states declared for the atom of each element.

In that atom of element where electrons retain mass (length) more than half on upward sides toward north side from the centers of their clamped energy knots is related to gas behavior because of favorable exceeding contraction level. In that atom of element where electrons retain mass (length) more than half on downward sides toward south side from the centers of their clamping energy knots is related to solid behavior because of favorable exceeding expansion level. Because of pushing of electrons (under lost potential energy) in attempting levitation behavior, their clamped energy knots remain in contraction (maximum), so, they remain hold inside clamping energy knots under the support of their upwardly directed sides (for more time); thus, the potential energy of each electron in the atom remains the minimum in maintaining its gas behavior. Because of pulling of electrons (under gained potential energy) in attempting gravitation behavior, their clamped energy knots remain in expansion (maximum), so, they remain hold inside clamping energy knots under the support of their downwardly directed sides (for more time); thus, the potential energy of each electron in the atom remains the maximum in maintaining its solid behavior. In addition to original state of an atom, its each possible transition state maintains under increasing expansion (decreasing contraction for gas atom to go into liquid) or decreasing expansion (increasing contraction for solid atom to go into liquid) of clamping energy knots of electrons, which are as per potential energy of their electrons under dealing force. However, that atom doesn’t deal any of the transition state like recovery, or neutral, or re-crystallization or liquid when in the isolated system because of conserved force of the comprised electrons, hence, their conserved energy where keeping fix contraction-expansion of clamped energy knots.

Expansion is due to enabling energy knots clamping around the electrons in their atoms loose and relax. Contraction is due to the enabling energy knots clamping around
the electrons in their atoms tight and firm. In original solid behavior atom, electrons remain hold under the exertion of force downward to lower sides of their clamping energy knots, so, they seldom tap to upper sides of their clamping energy knots. Through tapping of certain electrons to their clamped energy knots where exerting force to them at upper sides, atoms of solid behavior deal different transition states while adjusting the rate of tapping their electrons as per influencing force with respect to acquiring orientation. In original gas behavior atom, electrons remain hold under the exertion of force downward to upper sides of their clamping energy knots, so, they seldom tap to lower sides of their clamping energy knots. Through tapping of certain electrons to their clamped energy knots where exerting force to them at lower sides, atoms of gas behavior deal different transition states while adjusting the rate of tapping their electrons as per influencing force with respect to acquiring orientation.

In the case of conversion of suitable atom of gas into its liquid state, the work done is positive while in the case of liquid into original gas state, the work done is negative. However, the work done approaches to zero if that atom converts into liquid state under the gain of energy by the involvement of force in a tensing mode where ground point is being reached near to ground surface, from the upward side. In the case of conversion of suitable atom of solid into its liquid state, the work done is negative while in the case of liquid into original solid state, the work done is positive. However, the work done approaches to zero if that atom converts into liquid state under the loss of energy by the involvement of force in a relaxing mode where ground point is being reached near to ground surface, from the downward side. Thus, conversion of atomic state from solid to liquid (and liquid to solid) and gas to liquid (and liquid to gas) is under the inter-changeable force-energy behaviors. This is an inter-changeable force-energy paradigm where electrons designate their atoms to be in liquid state from original gas (or solid) behavior and to be in gas (or solid) behavior from liquid state.

Atoms deal contraction and expansion through clamping energy knots to their electrons. Both recovery and re-crystallization states are sub-states of atoms before and after the neutral state. A central state of the atom is the neutral state of its certain electrons where elongation along the east west poles becomes impartial and both
contraction-expansion of clamping energy knots to those electrons become unbiased. In this regard, the concepts of positive and negative charge are no longer workable, so, their presence in the shells or orbits also, conduction and valance bands also and presence of band gap between conduction and valance bands under varying fermi level also. Thus, atoms of various elements are to be considered related to force-energy behaviors of electrons in their clamping energy knots where their prescribed number of electrons deal relative ground points as set by the nature; at above ground surface, at ground surface and at below ground surface depending on the number of electrons along with their configuration.

Atoms of certain elements deal conversion into a new state having different physical behavior where transfer of suitable filled state electrons to unfilled ones takes place, for example, carbon. Atoms form nearly elliptical shapes where their electrons are being held by clamping energy knots. Atoms work as per their first-hand allocated nature since their existence as it is recognized physically by account of filled (and unfilled) states along with total number of electrons. Atoms start to work for possible transition state (from gas to liquid or solid to liquid) under different force-energy behavior of the dealing environment, which is obviously different from the environment of their birth where they don't gain or lose potential energy of electrons under tensing or relaxing mode, respectively. In the current scenario, eliminating the neutrons and protons in the existing configuration of atoms and considering only the electrons embedded in the available net of energy knots with the addition of two to form zeroth ring (except hydrogen) is appeared to be qualified for atomic structure of different elements. Presented scheme of atoms allow one to develop new atoms under the design of new lattices arresting higher number of electrons to the available ones, thus, working for new flavors of matter, which falls between the existing atoms and molecules or nanoscale components.

In line with this, the basics of Periodic Table are to be reviewed as it is the foremost and easy way of assembling elements because of their characteristics. There is an actual need to revisit complete basics of electricity and magnetism, heat and thermodynamics, fluids and combustion, theoretical and quantum physics, optics and
photonics, modern physics along with often-discussed phenomena. There is a need to look a large portion of chemistry and other disciplines of science in various areas, too. Overall, less documented in explanation and hidden scientific phenomena now require more attention. The present work attests sustainable utilization of materials starting from an atom and in the best practice for science and technology, biological and medical applications or wherever atoms place their role.

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**Author's biography:**

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 Institute of Information Technology, Islamabad campus, 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 (IMR), Tohoku University, Japan to deliver scientific talk on growth of synthetic diamond without seeding treatment and synthesis of tantalum carbide. 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 PhD study) by the Government of Pakistan but he couldn’t avail. He is author of several articles published in various periodicals (https://scholar.google.com.pk/citations?hl=en&user=UFyjDwAAAAJ).