

# Hypothesis on MATTER

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Alternative hypothesis, presented in book, 'MATTER (Re-examined)' is a revolutionary new concept, which explains all physical phenomena on the basis of a single assumption – 'Substance is fundamental and matter alone provides substance to all real entities'. Unstructured matter-particles, derived from this assumption - Quanta of matter – in various combinations form an all-encompassing universal medium and all 3D matter-bodies. Itinerary, that lead to development of this concept, is briefly enumerated below. All steps along development of this concept and their conclusions are based on logical elaborations from characteristic properties of postulated quanta of matter. Except quanta of matter, no virtual particles, vague entities or their assumed properties are used. Kindly refer the book for detailed explanations on any point.

**Space is a functional entity, presupposed by rational beings, whenever matter-bodies are envisaged. It has no form. Lack of structure prevents its deformation.**

It provides an imaginary place for matter body's existence. It becomes real only when it is entirely filled by a universal medium.

For convenience of relating different matter-bodies (or parts of same entity), space is partitioned by three mutually perpendicular planes to create three-dimensional spatial system.

**Since matter alone provides substance, it is the only real entity. All others are functional entities. Only real entities can act or be acted upon.**

Matter gives substance to real entities. Mass is mathematical relation between external effort on a matter-body and its acceleration. Motion indicates work-done about the matter-body.

Work is primary entity. Since work is deformations in universal medium that moves a matter-body, it is real. Force is a functional entity, representing rate of work-done.

Energy, a functional entity associated with matter-body, is stress developed in universal medium due to work-done about matter-body.

**Fundamental measurements define relation between matter-bodies.**

Distance measurement scale is defined with reference to an intrinsic motion at constant speed.

Invariable natural motion, in conjunction with scale of distance, defines functional entity of time.

Structure-less time is unable to contract or expand.

Since we have no reference for matter content, no fundamental measuring system is devised for it.

Instead, we are compelled to use derived approximations – mass or weight – to measure it.

**Quanta of matter, with unique properties, are the only postulated matter-particles in this concept.**

Quanta of matter are very small bits of real (unstructured) matter. Matter contents in them may not be equal. Although they are single-dimensional entities, they have real existence in all spatial dimensions. There is infinite number of quanta of matter in nature.

Quanta of matter are indivisible and maintain their individuality under all conditions. They have highest matter-density in nature.

Matter-content in quantum of matter (or in quanta of matter in direct contact) has tendency to coagulate. This produces action similar to attraction, between adjacent points in their matter-contents.

Tendency to coagulate produces inherent property of self-adhesion in quantum of matter. Self-adhesion endows quanta of matter with properties of self-constriction and self-elongation.

Self-constriction compels a quantum of matter to reduce its existence in any spatial dimension to minimum. Self-elongation compels a quantum of matter to revert to lower spatial dimension.

External efforts from ends of single-dimensional quantum of matter restrict its growth in length and compel it to grow into 2D spatial system, until it becomes circular shape in a plane.

Further compression from all around its periphery compels the quantum of matter to grow into 3D spatial system. This is the instant of creation of 3D matter.

Release/reduction of pressure/effort on higher-dimensional quantum of matter reverts it to lower-dimensional spatial system.

Two quanta of matter in different spatial-dimensions co-exist at the point of their intersection. Two quanta of matter in same spatial-dimension cannot co-exist.

**In order to interact, two quanta of matter have to be in direct contact. There are no 'actions at a distance through empty space'.**

Self-adhesion between matter contents of two quanta of matter, in contact, compels them to line up in same 1D spatial system. Great many quanta of matter form quanta-chain in a straight line.

Each quanta-chain holds excess number of quanta of matter so that all of them are under compression from their ends.

More than two quanta of matter at a junction-point align in same plane with equal angular difference between them.

**Quanta of matter (of equal matter contents) at many junction points, together, form latticework-structures with quanta-chains perpendicular to each other, called 2D energy-fields.**

All possible planes in space have one 2D energy-field each. A 2D energy-field extends infinitely in all directions in its plane. Since it is made of quanta of matter, 2D energy-field is a real entity.

Having 2D energy-field in each plane of space, they fill entire space. 2D energy-fields, in all possible planes, together form universal medium. Universal medium encompass all 3D matter-particles in universe. Matter density of universal medium is the same as that of a quantum of matter.

Universal medium is inherently stable system. It tends to maintain its stability, continuity, homogeneity, isotropy and serenity at all times. It has perpetual in existence, except for occasional local breakdowns.

A 2D energy-field acts only in its plane. Actions of a 2D energy-field in one plane cannot influence 2D energy-fields in other planes, directly. 2D energy-fields in different planes, passing through a point in space, co-exist. Simultaneous actions in many 2D energy-fields appear as an action in 3D spatial system.

Quanta of matter in a 2D energy-field are in quanta-chains (in perpendicular directions in same plane) crossing at junction points. In stable 2D energy-field, each junction-point has four quanta of matter.

A distortion or entity that may cause structural distortion in 2D energy-field is a disturbance.

2D energy-fields tend to reduce disturbance in them to minimum magnitude and expelling it from its current location, when possible.

All higher-dimensional spatial systems and matter-bodies exist within universal medium. They are disturbances with respect to universal medium.

Universal medium is instrumental for all apparent interactions between matter-bodies.

Universal medium, together with 3D matter particles in it, form a single block of matter of highest density. However, as 3D beings, we can appreciate only 3D matter-bodies and actions by or on them. Actions on 3D matter-bodies, by/within universal medium, are interpreted as interactions

between 3D matter-bodies. Universal medium and its actions remain hidden. Thus, we came to consider that only 3D matter and their interactions constitute the universe.

**Distortions in universal medium cause strain and associated stress in its latticework-structures.**

**Strain, being displacements of quanta of matter, is a real entity – work-done. Stress, associated with distortions in universal medium is energy, corresponding to the work-done.**

Latticework-structure of 2D energy-field causes development of sequential distortions in neighboring latticework-squares. Distortions, once developed, remain within universal medium, until removed by external action. These phenomena give rise to property of inertia.

Although, seemingly rigid quanta of matter form universal medium, latticework-structures by them endows it with properties of perfect fluid.

Group of free quanta of matter, within a gap in universal medium, form a disturbance. All higher-dimensional matter-particles are compressed groups of quanta of matter and hence are disturbances with respect to universal medium.

All 3D matter-particles are created from, sustained by and reverted into universal medium.

**Transfer of distortions in universal medium carries 3D matter-particles in the region along with distortions. Matter-bodies are inert. They are moved by universal medium.**

Development of distortions and their transfer at constant linear speed in universal medium, takes certain time. This property of inertia is an attribute of universal medium. All actions, on matter-bodies, are understood by their inertial motions.

Universal medium, as a whole, remain static while distortions in them are transferred. Absolute motions of matter-bodies are with respect to steady universal medium. Universal medium provides an absolute reference.

Region of universal medium, about a 3D matter-body, store work in the form of distortions (and energy in the form of stress due to distortions) to sustain integrity and stability of 3D matter-bodies and its state (of constant motion). This region of universal medium is its matter-field.

**A gap in universal medium is filled by surrounding latticework-structures extending into gap. This is gravitational action and it is caused by compressed state of quanta-chains.**

Tendency by 2D energy-fields in universal medium, to close-in into a gap in it, applies gravitational pressure on any entity present in the gap.

Gravitation is enormously stronger than other manifestations of ‘natural forces’. It is of push nature. Its magnitude is proportional to the extent of universal medium, producing the action.

Gravitation originates all other manifestations of natural forces. Different natures of ‘natural forces’ are a myth.

Gravitational actions on a group of free quanta of matter, within a gap in universal medium, compress them to create 3D matter.

Gravitational actions by universal medium are directly on to matter-particles. Universal medium interconnect every 3D matter-particle in universe. Gravitational actions change instantly during variations of parameters of a macro body.

Gravitation is unable to act on straight (flat) perimeter of matter-bodies. It acts only on (convex) curved perimeters. Since, all basic 3D matter-particles are disc shaped, gravitational actions on them are mainly on their curved periphery and little on their disc faces.

3D macro bodies are porous to 2D energy-fields. They are unable to screen gravitational actions.

**Smaller extent of universal medium, in between two matter-bodies, compared to extent of universal medium on their outer sides cause resultant of gravitational actions, which tends to move matter-bodies towards each other. This action is gravitational attraction.**

Gravitational attraction is relatively a minor by-product of gravitation. Gravitational actions mainly create 3D matter and sustain stability and integrity of 3D matter-bodies.

Gravitational attraction between macro bodies is between their constituent 3D matter-particles, whose curved perimeters are in same planes at any given instant. There are extremely few of

them in each macro body, which contribute towards gravitational attraction between them, at any instant. Hence, gravitational attraction is portrayed as very weak.

Practical gravitational constant is extremely small compared to its value in 2D spatial system.

Inverse square law breaks down on many occasions for various reasons. It is not a universal law.

A macro body has only one centre of gravity. It has to have a single continuous surface.

Magnitude of acceleration due to gravity is greater on macro bodies, when they are cooler.

**When a gap in universal medium is reduced by gravitation, free quanta of matter within the gap are gathered and compressed to gradually convert them to a single 3D matter-particle. This is the creation of 3D matter.**

All basic 3D matter-particles are of same critical radial size. They are of segmented spherical (disc) shape, with thickness proportional to their matter-contents.

Uneven curvature on their disc-face creates additional gravitation to eject them out of 2D energy-fields of their creation. Asymmetry of ejection effort initiates spin motion about one of their diameters. Linear and spin speeds are gradually stabilized to their critical values.

Distortions around ejected 3D matter-particle stabilize to move it at highest permitted linear speed and to rotate it at a spin speed proportional to its matter-content. This basic 3D matter-body, together with associated distortions in universal medium, is a photon.

Photons are corpuscles of light and other radiations. Their matter and energy components cause and support each other for stability and integrity.

For all practical purposes, distortions in universal medium, moving photon's matter-core appear like electromagnetic (transverse) wave. This phenomenon produces dual nature of light.

Linear speed of light is a critical constant because, that is the highest linear speed, at which universal medium move a 3D matter-particle. Magnitude of linear speed depends on nature of universal medium.

Attempt to increase photon's linear speed increases its matter-content (frequency) rather than its linear speed. Attempt to reduce photon's linear speed reduces its matter-content (frequency) rather than its linear speed.

Superimposition of linear and spin speeds of photons gradually drains matter-contents, in the form of liberated quanta of matter, leading to red shift of radiation during long passages in space.

Inability of photons, coming from very distant macro bodies, to maintain their matter-contents within observable (frequency) limit creates boundary of universe for any observer. This limit is of equal distance in all directions from the observer.

Photons, losing all their matter-contents during passage through space, leave behind part of associated distortions in universal medium. This part appears as background radiation.

Disproportionate changes in work, required for its stability, during changes in matter-contents of photons gives rise to phenomenon of 'packing fraction' during combination of two or more macro bodies.

Matter cannot be compressed to higher matter-density than that of a photon.

**Continuous flow of photons is radiation. Transmission of distortions in universal medium, disassociated with 3D matter-particles, is electromagnetic wave.**

Velocity of all radiations and electromagnetic waves are limited to linear speed of light. This is because; linear speed of light is the ultimate speed at which distortions in universal medium can be transferred.

Speed of light in a moving matter-field is same in all directions. However, it obeys all rules of relative motions with respect to an observer, who is independent of moving matter-field.

Changes in nature of universal medium vary constancy of speed of light. Since scale of distance depends on speed of light, change in constancy of light's speed is apparent to observers outside the region of universal medium, where light is transmitted. Number of 2D energy-fields, traversed by a photon in constant interval, always remains constant.

All properties of light can be explained by its corpuscle nature. Light is affected by gravitation and gravitational attraction, like any other matter-body.

An external effort in the direction of its motion cannot affect a photon.

Reflection of light happens in matter-field of macro body, near reflecting surface.

Reflection and refraction of light are results of changes in shapes of photon's matter-core.

Changes in direction of distortions in a matter-field cause selective reflection/refraction. Macro bodies do not absorb photons of frequency above that of heat rays. Photons of frequencies other than a macro body's characteristic color are scattered.

Doppler Effect affects light differently than its effects on sound waves.

Diffraction of light is a combination of reflection, refraction and gravitational attraction.

Interference of light is a special case of diffraction. It is quite different from interference of electromagnetic waves.

Emission/absorption spectra are cases of selective refraction in a varying matter-field.

**All superior matter bodies are made of photons, in various combinations. A macro body is a block of distorted region of universal medium– its matter field – sparsely populated with photons.**

Moving distortions, in matter-field of a macro body, displace constituent photons along with them, without affecting inherent motions of photons, to move macro body.

Since it is the universal medium, which carries 3D matter-particles of a macro body, motion of macro body is not resisted by universal medium. Aether drag is a myth.

Efficiency of an external effort, to act on a macro body, reduces in inverse proportion to present magnitude of additional distortions (macro body's linear speed) in its matter-field, in the direction of macro body's motion. This phenomenon causes relativistic mass.

Distortions in matter-field, causing linear and rotational motions, are distinct. They cannot combine.

Instantaneous direction of linear motion of a macro body, moving along a circular path, is deflected outward from tangent. Perpendicular component of circular motion gives rise to imaginary centrifugal force.

Limit on additional work that can be stored in matter-field of a planetary body, under 'central force', keeps its radial velocity constant irrespective of its constant acceleration.

One part of 'central force' provides planetary body with its radial motion while other part spins it in the plane of orbital motion.

Matter-field of a linearly moving macro body contracts in the direction of its motion to contract its length, while expanding in direction perpendicular to the direction of linear motion.

**By their inherent nature, universal medium moves a stable photon in straight line.**

A photon, moving in a curved path remains stable by its matter-content, while it remains unstable by its inertial-pocket (associated distortions in universal medium).

Unstable inertial-pockets of photons, moving in curved path, can cause attraction or repulsion between them. This action is attributed to field-efforts. Difference between distortion-densities (on either side) initiates displacements of photons towards or away from each other.

**Two complimentary photons, under suitable conditions form a binary unit of a biton.**

Bitons are self-sustaining primary 3D matter-particles.

Constituent photons of a biton move along common circular path at their critical linear speed, while spinning about a common axis through centre of biton.

Constituent photons of a stable biton tend to keep their matter-contents equal and maintain distance between them in relation to nature of universal medium in the region.

Depending on nature of universal medium in a region, bitons strive towards most stable matter-content level – ground state of matter-bodies in that region.

Gain of matter-content by a constituent photon is tolerated in biton but accidental loss of matter-content by a constituent photon leads to spontaneous combustion of macro body.

Bitons, when moving in linear direction, tends to align so that their planes are perpendicular to direction of linear motion.

Only bitons and photons can survive at linear speeds approaching that of light. At the speed of light, bitons also break down. Only photons can survive at the speed of light. Beyond this speed no matter-bodies can move.

Continuous and repeated motion of unstable photons in a biton, along same curved path, endows it with an angular distortion-field. This is primary electric field.

Depending on the direction of motion and spin of their constituent photons, with respect to an external reference, bitons may be classified into different types.

**External pressure on a biton compels constituent photons to lose matter-contents and expand biton's radial size. This causes macro bodies' expansion in volume, during heating.**

Absorption of matter-content from very low (infrared) frequency-photons, by one or both constituent photons of a biton, causes reduction in its total matter-content and expansion of its radial size.

Heating is a process of losing matter and energy contents from a macro body. Matter-content of a macro body is highest when it is coolest and in free space.

Tendency of neighboring bitons in a macro body, to equalize their matter contents, causes conduction of heat in it.

Temperature of a macro body is the relation of matter-content levels (radial sizes) of its constituent bitons to same of bitons in a reference material at reference external conditions.

Internal pressure in a macro body corresponds to external pressure on its constituent bitons.

On heating a macro body, its bitons discard quanta of matter. Universal medium converts discarded quanta of matter into photons, which radiate as heat rays or rays of higher frequency.

All very large macro bodies produce radiation by gravitational collapse. There needs not be atomic fusion/fission in stars for this purpose.

Physical state of a macro body depends on its total matter-content and external pressure on it. Innermost biton in a macro body (in free space) is least dense.

If a fluid macro body is near another large macro body, biton (and corresponding atom/molecule) at the bottom-centre is least dense. Tendency of least dense atom/molecule to rise to the top produce Brownian movements in fluid macro body.

**Two complimentary bitons may approach each other under gravitational attraction and form a single unit – a tetron.**

Tetron is a self-sustaining primary matter-particle. In stable state, its constituent bitons are in planes perpendicular to each other. All photons in a tetron reach stable state, when their matter-contents are equal and they spin in synchronism.

Primary electric fields of constituent bitons of a tetron are in perpendicular planes and hence they do not form resultant distortion-field.

Free tetrons, in space, approach each other under gravitational attraction and form groups in single layers. As and when a layer of tetrons becomes large enough, it bends upon itself to form hollow sphere – a tetron-shell, called a neutron.

Primary electric fields of constituent bitons of neutron mutually inactivate. A neutron has very weak external resultant distortion-field. Hence, it is an electrically and magnetically neutral body.

Due to its very low binding strength, independent neutron is unstable and is easily broken-down by external effort. Splintered groups of tetrons from a neutron (or a proton) may be of different matter-contents and have different resultant distortion-fields. This appears as if a neutron is made of numerous types of primary/basic matter-particles.

Since neutrons have no resultant distortion-field about them, they do not take part in chemical activities. When it is part of nucleus of an atom, it may change atom's physical parameters.

In nature, neutrons serve mainly as spacers or counter-weights in spinning nuclei, to balance them.

**Combination of bitons to form superior 3D matter-particles, combine their primary electric fields to create resultant distortion-fields about resulting 3D matter-particle.**

Distortion fields are continuously strained part of universal medium about a matter-body.

Imaginary lines of force, with arrows on them, represent distortion-fields. Straight lines represent magnetic field, circular (curved) lines represent electric field and radial lines represent nuclear field. Lines with low curvature are considered as straight lines.

Distortion-fields may be classified according to nature of distortions in them. Linear distortions give rise to magnetic effects. Angular distortions, within zilch-effort distance, give rise to electrical effects. Angular distortions, beyond zilch-effort distance, give rise to magnetic effects. Radial distortions give rise to nuclear effects.

Region, from which magnetic lines of forces appear to come out from magnetic field-producing macro body, is assigned north magnetic polarity. Region, into which magnetic lines of forces appear to enter magnetic field-producing macro body is assigned south magnetic polarity.

Electric field, being circular, has two faces. Face, where lines of force appear in clockwise direction, is positive electric charge. Face, where lines of force appear in anti-clockwise direction, is negative electric charge. Electric charge is a relative reference. Every electric field has both positive and negative electric charges.

Nuclear fields, whose lines of force are outward from a centre point, are repulsive nuclear fields. Nuclear fields, whose lines of force are towards a centre point, are attractive nuclear fields.

Geometrical necessity makes axes of electric and magnetic fields, perpendicular to each other.

Depending on their arrangements, magnetic fields may supplement or reduce each other.

Depending on their arrangements, electric fields may supplement or reduce each other. However, nuclear fields cannot augment or reduce each other.

Overlapping distortion-fields vary distortion-densities in a region. Transfer of distortions by universal medium to stabilize uneven distortion-densities carries 3D matter-particles in a region to produce inertial action of macro bodies producing distortion-field. This inertial motion is attributed to action of field-efforts.

Similar magnetic polarities apparently repel and dissimilar magnetic polarities apparently attract each other.

Within zilch-effort distance, similar electric charges apparently repel and dissimilar electric charges apparently attract each other. Beyond zilch-effort distance, similar electric charges apparently attract and dissimilar electric charges apparently repel each other. At zilch-effort distance, interaction between electric fields does not produce inertial actions.

An electric field with low curvature acts as a magnetic field, whose axis is perpendicular to axis of the electric field.

Repulsive nuclear fields apparently repulse each other. Attractive nuclear fields apparently attract each other. An attractive nuclear field and a repulsive nuclear field apparently repulse each other. Attractive nuclear field apparently attracts all neutral bodies. Repulsive nuclear field apparently repulse all neutral bodies.

**Three complimentary bitons may approach each other under gravitational attraction to form a single unit of hexton.**

Hexton is a self-sustaining fundamental 3D matter-particle. Each of its constituent bitons occupies one of mutually perpendicular planes in 3D spatial system.

Bitons in a hexton tend to maintain their relative positions and to maintain hexton's photons at equal matter-contents and spinning in phase each other.

There are two types of hextons –positrons and electrons. They are structurally identical.

Primary electric fields of bitons of a hexton combine to form resultant distortion-fields about it.

A positron has north magnetic polarity at both its poles and it has no well-defined south magnetic polarity. It has a resultant electric field around its equatorial region. It has attractive nuclear field about its poles.

An electron has south magnetic polarity at both its poles and it has no well-defined north magnetic polarity. It has a resultant electric field around its equatorial region. It has repulsive nuclear field about its poles.

Positrons apparently attract all other 3D matter-particles. Electrons apparently repel all other 3D matter-particles. Electrons, in free space, tend to settle away from each other. 'Sea of electrons' is not tenable in electric conductors.

Directions of linear and spin motions of corresponding photons in a positron and in an electron are opposite. Positrons and electrons are anti-bodies to each other. If they come in contact, all motions neutralize and matter-contents all constituent photons of both revert to universal medium as quanta of matter. This is annihilation of 3D matter.

**Under gravitational attraction, free tetrons may approach a positron and form two parallel layers around its equator.**

When tetron-layers are large enough, they bend on themselves to form two tetron-shells enclosing each of positron's hemispheres and form a deuteron.

Deuterons are self-sustaining fundamental matter-particles. Each deuteron is presently counted as one proton plus one neutron. Deuterons are major components of atomic nuclei.

Tetron-shells of deuteron prevent other 3D matter-particles meeting its positron.

**A positron migrating into a large tetron-layer or into a tetron-shell, together with single tetron-shell, forms a proton.**

Proton is a self-sustaining fundamental matter-particle. Protons are usually created during 'pair production' in free space. A proton usually finds an electron to pair off and produce Hydrogen atom. Hydrogen atoms are produced very often in space and this accounts for abundance of Hydrogen in universe.

Physically there are two types of Hydrogen atoms. In one type, tetron-shell of proton encloses negative electric charge of positron and in other type, tetron-shell of proton encloses positive electric charge of positron.

Primary and fundamental matter-particles are constituted by photons, moving in curved paths about their periphery and enclosing blocks of universal medium. They may have a cloudy appearance.

**Deuterons apparently attract each other very strongly. Deuterons, in various arrangements form nuclei of atoms under chaotic (violent) conditions. Occasionally stray neutrons and rarely free protons are captured to be parts of nuclei.**

Deuterons form circular sections and these sections join axially to produce a whole nucleus. Shape of a nucleus (of relatively large size) is tubular, with circular sections of different girth.

Physical sizes of nuclei (and atoms) of different elements are different. Outer shape of an atom is generally oblong spherical.

Availability of deuterons and mechanical stability and integrity of a spinning nucleus is the sole criteria to determine type of nucleus formed.

**Nuclei apparently attract available electrons, to capture them in orbits and form atoms.**

Atoms are self-sustaining 3D matter-bodies. Number of deuterons and their arrangements in their nuclei determines physical and chemical properties of atoms.

First electron, approaching to orbit around a nucleus, initiates nucleus' spin motion. Spin motion of atomic nucleus cause production of secondary electric field about the atom.

In a stable atom, 'central force' between nucleus and orbiting electron is provided solely by gravitational attraction between them. Other field-efforts develop only during unstable states. Orbiting electrons obey all planetary laws with certain modifications.

Electrons orbit around nucleus in synchronism with spin motion of nucleus. Each electron is paired with one of the positrons in nucleus. Total number of electrons in an atom is strictly equal to number of positrons in nucleus.

Wobbling or vibration of spinning atoms, due to asymmetry of distribution of matter-content, causes speed variations of constituent photons. This leads to cyclic rejection of quanta of matter from photons and accumulation of quanta of matter from universal medium by photons. Rejected quanta of matter form new photons, which are radiated from the region of nucleus. This causes high frequency radiation (radioactivity) from certain type of atoms.

Atoms are extremely robust 3D matter-bodies. Other than in extreme conditions, no 3D matter-particles may be added to them or removed from them.

**Depending on the type of resultant distortion-fields of its nuclear sections, a completed atom may have a resultant distortion-field about it.**

Resultant distortion-fields of atoms make them chemically active. Those atoms, which do not have resultant distortion-fields, are chemically inert.

Resultant distortion-fields of atoms encourage them to form molecules or larger clusters by joining with different types of atoms until combined group has no external resultant distortion-field.

**Electric potential of an atom is the angular difference of its present orientation with respect to neighboring atoms in their natural stable orientations. Single atoms cannot be ionized.**

Electric generation and electric induction are distinctly separate phenomena.

Electric potentials of all atoms, in generating/induction area, are equal. Electric potential of atom at geometrical central point in a current carrying conductor is zero.

**There are no translational motions of fundamental matter-particles, along a conductor, during an electric current.**

Electric current is an extension (of production) of resultant electric fields along a conductor.

Extension of electric field, carried out by associated magnetic fields in neighboring atoms, starts from generation/induction area and progress in both directions.

In a current carrying conductor, every plane perpendicular to its axis has one resultant electric field each of same magnitude.

Outside generation/induction area, angular differences between atomic axes and nuclear axes in atoms induce resultant electric field about them,.

Translational motion of a neutral atom in a magnetic field cause electric generation. Variation in strength of magnetic field, about neutral atoms, causes electric induction.

Interaction between an electric field and a magnetic field produces motoring action.

Motoring action in a magnetic field, with a gradient, tends to orient independent bitons so that their primary electric fields are in attractive phase with region of higher magnetic density. This phenomenon causes repulsion between neighboring spinning galaxies.

**Angular deflections of atoms in capacitor plates cause electrostatic fields, between two capacitor plates. There are no migrations of fundamental matter-particles.**

Electrostatic field is strained part of universal medium between capacitor plates.

Resultant magnetic fields of atoms/fundamental particles cause their apparent attraction towards positive or negative capacitor plates.

Breakdown of universal medium between capacitor plates is an electric arc.

If atoms in a dielectric medium, between capacitor plates, are free to turn, they absorb strain in electrostatic field to spin themselves. During this unnatural spin motion, atoms discard quanta of matter, which are converted to photons and radiated to produce glow discharge.

Photoelectric effect is produced by variation in electric potential of atoms due to absorption of photons by macro body (of certain materials), situated in an electrostatic field. Electric circuit is not complete during current flow under photoelectric effect.

**Tendency of atoms, in macro bodies of different material, in contact, to align with each other causes contact electric potential difference between farther ends of macro bodies.**

Establishment of electric field in electrolyte of a cell causes dissolution of electrolyte compound rather than in reverse order.

Mechanical deflections of atoms in a macro body, from their natural orientation, produce static electricity.

**Electromagnetic wave is transmission of distortions (not associated with matter-particles) through universal medium.**

In an electromagnetic wave, magnetic nature is transmitted and recipient macro body produces electric nature, locally.

Cyclic deflections of atomic axis, about its natural orientation, produce electromagnetic wave.

**Various physical states of matter are applicable only to macro bodies. Natural physical state of a macro body (or its parts) depends on its total matter-content and nature of surrounding universal medium.**

Magnitudes of apparent attraction between neighboring atoms in a macro body determine its physical state.

In solid and liquid states, electronic envelopes of neighboring atoms are situated within zilch-effort distance. A change in matter-contents of atoms facilitates changes in a macro body's physical state between solid and liquid states.

In gaseous state, electronic envelopes of neighboring atoms are situated beyond zilch-effort distance. It is necessary to increase matter-contents of atoms and simultaneously bring macro body's atoms nearer, by compression, to liquefy it.

In plasma stage of a macro body, electronic envelopes of atoms are stripped off.

Boiling point is not a true latent stage. Ebullition from heating surface causes it.

**Reaction to shearing in common matter-field between two macro bodies causes friction.**

Due to changes in linear speeds of constituent photons of rubbing macro bodies, photons discard quanta of matter, which are converted to photons and radiated as heat rays.

**All free macro bodies, except stable galaxies, need constant linear (translational) motion to exist.**

Galaxy is a huge spinning cluster of macro bodies. A halo develops on its periphery, where 3D matter-particles exist only in the form of bitons.

A halo may have magnetic fields in opposite directions, each one facing another galaxy.

Galaxies tend to remain without translational motion in space. Electromagnetic action between halos of neighboring galaxies overcomes attraction due to gravitation between them. Other macro bodies do not have this protection.

**Except for magnitude of its matter-content, a black hole is an ordinary macro body. Magnitude of matter-content is comparable to that of a galaxy. It has no mysterious properties.**

Compression (by gravitational collapse) of a macro body produces radiation from its matter-field and enlarges its size.

Gravitational attraction between photons and a black hole tend to slow down photons radiated from the region of a black hole.

Attempt to reduce photons' linear speeds, reverts their matter-contents into universal medium, before they escape gravitational influence towards black hole. This makes black hole invisible.

Black holes help to recycle 3D matter and help to keep entropy of universe within limits.

A black hole has to pass through the stage of a pulsar, before it explodes, to create super nova.

Pulsars pulsate under alternating radial movements of universal medium due to conversion and reversion of its central region into and out of plasma state of matter.

**Planetary bodies orbit about path of their central bodies in wavy paths. Both planetary and central bodies move in the same direction in space.**

Part of a planet's orbital path between two identical appearances, when equated to observed nature of orbital motion, produce its apparent orbit.

Apparent orbit of a planet is oval. Linear speed of a planet needs not be highest at periapse, where distance between central and planetary bodies is least. Linear speed of a planet needs not be

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lowest at apoapse, where distance between central and planetary bodies is most.

Circular conditions of orbital path occur at periapse and apoapse. 'Central force' acts perpendicular to orbital path only at inner and outer datum points. Linear speed of planet is highest at outer datum point and least at inner datum point.

All planets in a planetary system have to enter the system from outside. They enter their orbits only through two small windows facing to the rear and in the plane of curved path of central body.

Apparent orbit and its precession are illusory. Shift of periapse or apoapse appears as precession of apparent orbit.

All planets and central body (of a stable planetary system) orbit and spin in same plane.

**Part of 'central force' on a planetary body spins the planet. Torques on planet alternates cyclically as it moves from one side of central body's path to the other.**

Only resultant spin motion (if there is any) is available to the planet. Hence, a planet may have spin motion in either direction or not at all.

All planets accelerate in spin motion. Insufficient compensation for solar days creates the illusion that earth is slowing down in its spin motion.

Torque, by 'central force', affects planet's equatorial region, most. Hence, equatorial region of all planetary bodies, with fluid surface, have higher spin speeds compared to their polar regions.

**Tides are changes in the shape of linearly moving-spinning macro body, under external effort.**

During tide, a macro body elongates in both directions along the direction of external effort. Any number of external efforts develops equal number of tides.

No work/energy is expended to create tides. Since tide is only an alteration of shape, it consumes no effort. Tides take place only during acceleration stages.

Magnitude of 'central force' between earth and moon, in each plane, is 2.3 times greater than that between earth and sun. Hence, on earth, lunar tides are 2.3 times greater than solar tides.

Relative direction of latticework-squares in earth's matter-field to direction of action of 'central force' causes tides to lead or lag from local meridian. We manipulate shift in the direction of tide to suit observation.

There is no translational displacement of ocean waters during tides. (Certain flow of water may be realized by level differences). Tidal drag on earth's crust is a myth.

**Secondary electric fields of free-floating atoms in fluid cover of a moving macro body produce its magnetism.**

Ocean waters cause terrestrial magnetism. Magnetic field, produced by each hemisphere of a planet is independent of each other.

Since orientations of free atoms in ocean-water are mechanical activities, magnitude and direction of terrestrial magnetism can vary at random.

**Reference:**

[1] Nainan K. Varghese, *MATTER (Re-examined)*, <http://www.matterdoc.info>

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