

Hypothesis on

MATTER

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Abstract: ‘Hypothesis on MATTER’ is a revolutionary new concept, which explains all physical phenomena based on just one type of (postulated) basic particle - the Quantum of matter. Conception and development of this model is founded on the conviction that there can be only one type of basic entities. They provide substance and create all other real entities in nature. All (apparent) interactions and diverse properties of superior entities are logical developments from inherent properties of the (postulated) quanta of matter. Quanta of matter, by their natural interactions, creates and structure all other entities including an all-encompassing medium. A wide array of physical phenomena are explained in the book [1]; from the origin of 3D matter to gravity and subatomic interactions to cosmological events, based on the simple mechanical interactions of quanta of matter. There is no more any need to envisage ‘actions at a distance’ or to invoke irrational assumptions like diversity of natural forces, mass-energy equivalence, duality of light or constancy of its speed, dual nature of electric charge, singularities, big bang, etc. This new concept will radically alter our understanding of the physical universe and at the same time, explain complex physical phenomena with simple ‘Cause and Effect’ relationships.

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Hypothesis on MATTER:

Itinerary, that lead to the development of this concept, is briefly enumerated below. All steps along the development of the concept and their conclusions are based on logical elaborations from the characteristic properties of postulated ‘quanta of matter’. Interactions of quanta of matter alone is sufficient to account for everything else in nature. Except quanta of matter, no virtual particles, vauge entities or their assumed properties are used. Kindly refer the book [1] 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, made up of real entities.

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

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

Real entities are perceived by sensory organs of rational beings. Functional entities exist only in the minds of rational beings.

Matter gives substance to a body to make it real. Mass is a mathematical relation between external effort on a body and the body's acceleration. Motion or other changes in parameters of a body indicates work-done about the body.

Work-done is a primary entity. Since work is displacement of universal medium that moves a matter body, it is real. Force and power are functional entities representing the rates of work-done with respect to displacement and time, respectively.

Energy, a functional entity associated with a matter body, is the stress developed in the universal medium due to work-done about the body. Energy cannot act. Transfer of work from one body to another causes action.

Fundamental measurements define relations between matter bodies or between parts of the same body.

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

Invariable natural motion, in conjunction with the scale of distance, defines the functional entity of time. Structure-less time is unable to contract or expand.

Since we have no reference for matter content of a body, no fundamental measuring system is devised for it. Instead, we are compelled to use derived approximations — mass or weight — to measure it.

This concept uses an absolute frame of reference. Relativistic considerations are good only to predict relative positions.

All physical constants are variable. Their magnitudes in a region depend on the nature of universal medium in that region.

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

Quanta of matter are very small bits of real matter. Matter contents of different quanta 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.

A quantum of matter can neither be created nor destroyed. They are indivisible and maintain their individuality under all conditions. Matter density of quantum of matter is the highest matter density in nature.

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

Tendency to coagulate produces self-adhesion as an inherent property of quantum of matter. Property of self-adhesion endows quanta of matter with characteristic 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.

A free quantum of matter in space reverts to single-dimensional spatial system. In this state, it has a body with two ends. It has length as its only spatial measurement.

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

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

Release/reduction of pressure/effort on higher-dimensional quantum of matter causes its reversion 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 the 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'.

Self-adhesion between matter contents of two quanta of matter, in contact, compels them to line up in the same single-dimensional space system. Great many quanta of matter form a quanta-chain in a straight line.

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

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

Quanta of matter (of equal matter contents) at many junction points, together, form latticework structures with their 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 a 2D energy field in each plane of space, they fill the entire space. 2D energy fields, as a whole, form a universal medium. 2D energy fields encompass everything else in universe. Matter density of 2D energy fields is the same as that of a quantum of matter.

A 2D energy field is an inherently stable system. It tends to maintain its stability, continuity, homogeneity, isotropy and serenity at all times. 2D energy fields have perpetual 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 about a point or a body appear as an action in three-dimensional spatial system.

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

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

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

All higher-dimensional spatial systems and bodies exist within 2D energy fields. All bodies in higher-spatial dimensional systems are disturbances with respect to 2D energy fields.

2D energy fields provide a universal medium for all apparent interactions between matter bodies.

Quanta of matter in 2D energy fields constitute 'dark matter' in the universe.

2D energy fields, together with all 3D matter particles in them form a single body (universe) of highest matter density. However, as 3D beings, we can appreciate only 3D matter bodies and actions by/on them. Actions on 3D matter bodies, by or within 2D energy fields, are interpreted as interactions between 3D matter bodies. 2D energy fields and their actions remain hidden. Thus, we came to consider that only 3D matter and their interactions constitute the universe.

Distortions in 2D energy fields cause strain and associated stress. This strain, being displacements of quanta of matter, is a real entity – the work-done. Associated stress in the 2D energy fields is the functional entity of energy, corresponding to the work-done.

Latticework structure of a 2D energy field causes sequential development of distortions in neighboring latticework squares. Distortions, once developed, remain within a 2D energy field, and move at constant speed until removed by external action. These phenomena give rise to property of inertia.

Although, seemingly rigid quanta of matter make the latticework structure of 2D energy fields, such structure endows 2D energy fields with properties of a perfect fluid.

Group of free quanta of matter, within a gap in 2D energy fields, form a disturbance. All higher-dimensional matter particles are compressed groups of quanta of matter and hence are disturbances with respect to 2D energy fields.

All 3D matter particles in nature are created from, sustained by and reverted back into the 2D energy fields.

Transfer of distortions in 2D energy fields carries 3D matter particles in the region along with the distortions. Matter bodies are inert. They are moved by the universal medium.

Development and transfer of distortions at constant linear speed, in 2D energy fields, takes certain time. This property of inertia is an attribute of 2D energy fields. All actions, on matter bodies, are understood by their inertial motions.

2D energy fields, as a whole, remain static while distortions in them are transferred. Absolute motions of matter bodies are with respect to steady 2D energy fields. 2D energy fields provide an absolute reference.

Region of 2D energy fields, about a 3D matter-body, store work in the form of distortions (and energy in the form of stress due to the distortions) to sustain integrity and stability of the body and its state (of constant motion). This region of 2D energy fields is matter field of the body.

Distortions in 2D energy fields, according to their nature, can be interpreted as gravitational field, electromagnetic fields, nuclear field, inertial field, etc.

A gap in 2D energy fields is filled up at once by surrounding 2D energy fields extending into the gap. This is gravitational action and it is caused by compressed state of quanta-chains.

Such tendency by 2D energy fields applies gravitational pressure on any entity present in the gap.

Gravitational effort is enormously stronger than other manifestations of natural forces. It is of push nature. Its magnitude is proportional to the extent of 2D energy field, producing the action.

Gravitation originates all other manifestations of natural forces. Different types of natural forces are a myth. It is their nature of action that differentiates them. All actions are understood by inertial motion.

Gravitational actions on a group of free quanta of matter, within a gap in 2D energy fields, compress them to create 3D matter.

Gravitational actions by 2D energy fields are applied directly onto 3D matter particles. No force-carrying particles are required. 2D energy fields interconnect every 3D matter particle in the universe. Gravitational actions change instantaneously during variations of a macro body's parameters.

Gravitation is unable to act on straight (flat) perimeter of a 3D matter particle. 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.

Since all 3D macro bodies are porous to 2D energy fields, they are unable to screen gravitational actions.

Smaller extent of 2D energy fields in between two matter bodies, compared to the extent of 2D energy fields on their outer sides cause a resultant of gravitational actions, which tends to move the bodies towards each other. This is apparent attraction due to gravitation.

Apparent 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.

Apparent gravitational attraction between macro bodies is between their constituent (basic 3D) matter particles, whose curved perimeters are in the same plane at any given instant. There are extremely few of them in each macro body, which contribute towards apparent gravitational attraction, at any instant. Magnitude of resultant effort is extremely small compared to gravitational actions. Hence, gravitational effort is portrayed as a very weak force.

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

Inverse square law on gravitational attraction 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 attraction due to gravity is greater on macro bodies, when they are cooler.

When a gap in 2D energy fields 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 particle.

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/existence. Asymmetry of ejection force initiates spin motion about one of their diameters. Linear and spin speeds of a newly created 3D matter particle are gradually stabilized to their critical values.

Gradually, distortions around the ejected 3D matter particle stabilize to move it at the highest permitted linear speed and to rotate it at a spin speed proportional to its matter content. Limitation of linear speed is due to the inability of constituents of 2D energy fields to move faster with breaking down the structure of the universal medium. This basic 3D matter body, together with its associated 2D energy field distortions, is a photon.

Photons are corpuscles of light and other similar radiations. Their matter content in the core body and the associated energy components in surrounding 2D energy fields cause and support each other for stability and integrity of the photon.

For all practical purposes, distortions in the 2D energy fields, moving a photon's core body appear like an electromagnetic (transverse) wave. This phenomenon produces wave-part of dual nature of light.

Linear speed of light is a critical constant because, that is the highest speed the 2D energy fields can cause to a matter particle. Magnitude of this speed depends on the nature of 2D energy fields. Hence it may vary from region to region in space.

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

Superimposition of linear and spin speeds of a photon causes gradual drain of its matter content, in the form of liberated quanta of matter, leading to red shift during a long passage in space.

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

Photons, losing all their matter contents during their passage through space, leave behind part of their 'inertial pockets' (associated distortions) in 2D energy fields. This part appears as background radiation to us.

Disproportionate changes in the work-done, required for its stability, during changes in the matter content of a photon gives rise to the phenomenon of 'packing fraction' during combination of two or more fundamental particles or macro bodies.

Matter cannot be compressed to higher matter density than that of a photon, in 3D space system. There can be no infinite matter density or singularity in nature.

Continuous flow of photons is a radiation. Transmission of 2D energy field-distortions, disassociated with matter particles, is an electromagnetic wave.

Velocity of all radiations and electromagnetic waves are limited to the speed of light. This is because; linear speed of light is the ultimate speed at which constituents of 2D energy fields can move distortions in it through the space.

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

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

All properties of light can be explained by its corpuscle nature. Light is affected by gravitation and apparent gravitational attraction, like any other matter body. Gravitational attraction is effective only in its disc-plane.

An external effort in the direction of a photon's motion cannot affect linear speed of a photon. Such an effort tends to increase its linear speed. However, this will increase photon's matter content (frequency) rather than its linear speed.

An external effort in opposite direction to a photon's motion cannot affect linear speed of a photon. Such an effort tends to reduce photon's linear speed. However, this will reduce photon's matter content (frequency) rather than its linear speed.

Reflection of light takes place in the matter field of the reflecting body, near the reflecting surface.

Reflection and refraction of light are results of changes in the shapes of photons' matter cores.

Changes in the 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 body's characteristic color are scattered from body-surface.

Doppler Effect affects light differently than its effects on a sound wave.

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

Interference of light is a special case of diffraction, 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 up of photons, in various combinations. A macro body is a block of distorted 2D energy fields – its matter field – sparsely populated with photons.

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

Since it is the 2D energy fields, which carry the matter particles of a macro body, motion of the macro body is not resisted by the universal medium. 'Aether drag' is a myth.

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

Matter field-distortions, causing linear and rotational motions of a macro body, are distinct and operate separately.

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

Inertial delay of stabilization is present during application of an effort as well as during withdrawal of an effort.

Limitation of each 2D energy field to act in its own plane keeps all inertial motions in straight lines.

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

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

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

By their inherent nature, 2D energy fields move a stable photon in a straight line.

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

Unstable inertial pockets of photons, moving in curved paths, can cause apparent attraction or apparent repulsion between them. This action is attributed to various field forces. Difference between distortion-densities in 2D energy fields initiates displacements of the 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 matter particles.

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

Constituent photons of a stable biton tend to keep their matter contents equal and maintain the distance between them in relation to the nature of 2D energy fields in the region.

Depending on the nature of 2D energy fields in a region, bitons strive towards most stable matter content level – the ground state of matter bodies in that region.

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

Bitons, when moving in linear direction, tends to align so that their planes are perpendicular to the direction of 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 the same curved path, endows it with an angular distortion field around it. This is the ‘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 from very low (infrared) frequency-photons, by one or both constituent photons of a biton, causes reduction of its total matter content and expansion of its radial size.

Heating is a process of losing matter and energy contents from a macro body. Cooling is a process of gaining matter and energy contents by a macro body. Matter and energy contents 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 the body.

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

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

As the internal pressure of a macro body is increased or on heating the macro body, its constituent bitons discard quanta of matter from their photons into the 2D energy fields. These quanta of matter are converted to photons of appropriate frequency by the 2D energy fields to be radiated from the region.

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

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

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

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

Tetron is a self-sustaining primary 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 a strong resultant distortion field about the tetron.

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

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

Due to its very low binding force, an independent neutron is very unstable and can be 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 up numerous types of primary/basic 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 the atom’s physical parameters.

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

Combination of bitons that form superior matter particles, combine their primary electric fields to create resultant distortion fields about the resulting matter particle.

Distortion fields are continuously strained part of 2D energy fields about a matter body. Strain in this region is maintained by repeated motions of constituent unstable photons along same paths.

Imaginary lines of force with arrows on them represent distortion fields. Straight lines represent a magnetic field, circular (curved) lines represent an electric field and radial lines represent a 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 force distance’, give rise to electrical effects. Angular distortions, beyond ‘zilch force 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 a magnetic field-producing body is assigned north magnetic polarity. Region into which magnetic lines of forces appear to enter a magnetic field-producing body is assigned south magnetic polarity.

An electric field, being circular, has two faces. The face at which the lines of force appear in clockwise direction is ‘positive electric charge’. The face at which the 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 is ‘repulsive nuclear field’. Nuclear fields, whose lines of force are towards a centre point is ‘attractive nuclear field’.

Geometrical necessity makes axes of electric and magnetic fields about a body, 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 the 2D energy fields to stabilize uneven distortion-densities carries any matter particle in the region to produce inertial action of the distortion field-producing bodies. This inertial motion is attributed to the action of field forces.

Magnetic polarities, if similar, apparently repel and if dissimilar, apparently attract each other.

Within zilch force distance, similar electric charges apparently repel and dissimilar electric charges apparently attract each other. Beyond zilch force distance, similar electric charges apparently

attract and dissimilar electric charges apparently repel each other. At zilch force 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 the axis of the electric field.

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

Three complimentary bitons may approach each other under apparent gravitational attraction and combine to form a single unit of a ‘hexton’.

A hexton is a self-sustaining fundamental matter particle. Each of its constituent bitons occupies one of the three mutually perpendicular planes in 3D space 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 – the ‘positrons’ and the ‘electrons’. They are structurally identical. Structurally, a hexton appears as a spherical block of universal medium with six spinning photons moving on its surface.

Primary electric fields of bitons of a hexton combine to form resultant distortion fields about it. Complicated directions of distortions about a hexton may be resolved in to three sets of distortion-fields – magnetic field, electric field and nuclear field.

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 fundamental particles towards it. Electrons apparently repel all other fundamental 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 physical contact, all motions will neutralize and matter contents all constituent photons of both bodies will (spontaneously) revert to 2D energy fields as quanta of matter. This is annihilation of 3D matter.

About 50% of all 3D matter particles are anti-bodies to the other 50%. Large scale annihilation of 3D matter particles is prevented by 2D energy fields by keeping them away from each other.

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

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

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

A deuteron has all characteristic properties of a positron. Tetron shells of deuteron prevent any other matter body physically meeting its positron.

If a positron migrates into a large tetron layer or into a tetron-shell, the positron together with a single tetron-shell forms the fundamental particle, ‘proton’.

Proton is a self-sustaining fundamental particle. Protons are usually created during ‘pair production’ in free space.

A proton, in free space, will usually find an electron to pair off and produce a Hydrogen atom.

Hydrogen atoms are produced very often in space and this accounts for the abundance of Hydrogen in universe.

Physically there are two types of Hydrogen atoms. In the proton (nucleus) of one type, its tetron-shell encloses positron's negative electric charge and in the other type, its tetron-shell encloses positron's positive electric charge.

Primary and fundamental particles are constituted by spinning photons moving in curved paths about their periphery and enclosing blocks of 2D energy fields. 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 part of nuclei formed.

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

Physical sizes of nuclei (and atoms) of different elements are dissimilar. 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 the type of nucleus formed.

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

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

The first electron, approaching to orbit around a nucleus, initiates nucleus' spin motion. Depending on the direction of spin, properties of similar atoms may differ.

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 apparent gravitational attraction between them. Other field forces develop only during unstable states. Orbiting electrons obey all planetary laws with certain modifications.

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

Wobbling or vibration of spinning atoms, due to asymmetry of matter distribution, causes speed variations of constituent photons. This will lead to cyclic rejection of quanta of matter from photons and assimilation of quanta of matter from surrounding 2D energy fields. Photons are created from rejected quanta of matter and radiated from the region of nucleus. This causes high frequency radiation (radioactivity) from certain type of atoms.

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

Depending upon 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 or same type of atoms until the combined body has no external resultant distortion field.

Modification of distortion fields (by presence of catalysts or other means) about atoms in close proximity initiates chemical reactions.

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

Mechanical deflection of an atomic axis with respect to its neighbors can cause electric potential.

Electric generation and electric induction are distinctly separate phenomena. Generation is caused by mechanical movement of a conductor within a magnetic field. Induction is caused by variation in the magnetic field-density about a conductor.

Electric potential of all atoms in generating and induction area will be equal. Electric potential of atom at the geometrical central point in a current carrying conductor is zero.

There are no translatory motions of fundamental particles, along a conductor, during an electric current.

Electric current is an extension (of production) of resultant electric fields along the conductor. This extension, carried out by associated magnetic fields in the neighboring atoms, starts from generation/induction area and progress in both directions.

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

Angular difference between atomic axis and nuclear axis in an atom induces resultant electric field about atoms in a conductor outside generation/induction area. Magnitude of resultant electric field in a plane perpendicular to the current carrying conductor is proportional to the average of angular differences in atoms in that plane

Translatory motion of a neutral atom in a magnetic field cause electric generation. Electric induction is caused by variations in a magnetic field about neutral atoms.

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 the region of higher magnetic density. This phenomenon causes apparent 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 particles in the electrical circuit about the capacitor or between capacitor plates.

Electrostatic field is permanently strained part of 2D energy fields between capacitor plates. Strain in an electric field is continuously maintained by moving photons.

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

Breakdown of 2D energy fields between capacitor plates makes an electric arc. Breakdown of 2D energy fields between electrically charged clouds produce lightning. Clouds gain electric potential by friction. Lightening does not originate or terminate on earth's surface.

If atoms in a dielectric medium between capacitor plates are free to turn, they absorb strain in the electrostatic field to spin themselves. During this unnatural spin motion, atoms discard quanta of matter, which, when converted to photons and radiated, 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. There are no displacements of electrons in the circuit.

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

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

Mechanical deflections of atoms in a body, from their natural alignment with respect to their neighbors, produce static electricity.

Tendency of atoms across a contact surface between two macro bodies to share their distortion fields produce friction between the bodies. Magnitude of friction depends on the relative motion of the bodies and intensity of distortion field-sharing.

An electromagnetic wave is the transmission of distortions (not associated with matter particles) through the 2D energy fields.

In an electromagnetic wave, its magnetic nature is transmitted through 2D energy fields and the recipient body produces the electric nature, locally.

In an atom, cyclic deflections of its nuclear axis from its natural alignment about atomic axis produce electromagnetic wave.

Various physical states are applicable only to macro bodies. Natural physical state of a body (or its parts) depends on its total matter content and nature of surrounding 2D energy fields.

Magnitudes of apparent attraction between neighboring atoms in a macro body determine the body's physical state.

Changes in the numbers of tetrons in tetron-shells of deuterons/neutrons/protons of an atom initiate changes in its physical state.

In solid and liquid states, electronic envelopes of neighboring atoms are within zilch force distance. A change in the 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 beyond zilch force distance. It is necessary to increase matter contents of atoms of a gaseous body and simultaneously bring the body's atoms nearer by compression, to liquefy the body.

Molecules/atoms of gaseous macro body have no natural random motion. They keep their relative positions with neighboring molecules/atoms.

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

Boiling point is not a true latent stage. It is caused by ebullition from heating surface.

Reaction to shearing in the matter field between two macro bodies causes friction.

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

All free bodies, except galaxies, need constant linear motions to exist in space.

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

A halo may have magnetic fields in opposite directions at different points on it, each one facing another galaxy.

Galaxies tend to remain steady in space. Apparent attraction due to gravitation between neighboring galaxies is overcome by electromagnetic action between their halos. Other bodies do not have this protection.

A black hole is a single body, with magnitude of matter content comparable to or more than that of a galaxy.

Compression of a macro body by gravitational collapse produces radiation from the body and expands the body.

Photons, radiated from black holes, are slowed down by apparent gravitational attraction between them and the black hole.

Attempt to reduce photons' speeds, revert the photons back into 2D energy fields before they escape gravitational attraction towards black hole. This makes the 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 under repulsive nuclear force from within the body region, to create a super nova. Pulsars pulsate under alternating nuclear fields produced by conversion and reversion of central region of its body into and out of plasma state of matter.

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

Part of a planet's orbital path between two identical appearances, when equated to observed nature of orbital motion, produce planet's apparent orbit. Apparent orbits consider relative motions of planetary and central bodies. They are convenient to predict future relative positions and cyclic phenomena on planetary bodies.

Apparent orbit of a planet is oval. Linear speed of a planet needs not be the highest at periapse, where distance between central and planetary bodies is least. Linear speed of a planet needs not be the 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 linear path only at 'inner and outer datum points'. Linear speed of a 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 a small window facing to the rear and in the plane of curved path of central body. Orbital path of a planet is not gradually developed. A planet enters its stable orbital path, abruptly.

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 the same plane.

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

Only the resultant spin motion (if there is any) will be 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.

Central force and torque introduced by it, affect planet's equatorial region, most. Hence, equatorial region of all bodies with fluid surface, in a planetary system, have higher spin speeds compared to their polar regions.

Tides are changes in the shape of linearly moving-spinning macro body, during the action of an external effort.

During tide, a macro body elongates in both directions along the line 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.

Magnitudes of central force between earth and moon (calculated according to this concept), in each plane, are 2.3 times greater than that between earth and the sun. Hence, on earth, lunar tides are 2.3 times greater than solar tides.

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

There is no translatory 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 the fluid cover of a spinning macro body produce the body's magnetism.

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

Since the alignment of free atoms in ocean water is a mechanical activity, magnitude and direction of terrestrial magnetism can vary at random.

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Since the book 'Hypothesis on MATTER' covers too many topics, explanation on each topic is brief. Conclusions are neither compared with nor are aimed to criticise current theories. Very little mathematics is used, instead, logical development of a theory from the postulated 'quantum of matter' is preferred. It is noticed that by postulating an ideal matter particle, all physical phenomena in nature can be explained. There are many conclusions, which are contradictory to well established scientific beliefs. By pursuing the book in a sequential order, these conclusions can be found to be logical and reasonable. Reading any topic, in isolation and before understanding the chain of reasoning/development of the concept, may not make much sense.

All constructive criticisms and opinions are most welcome. Kindly address them to Nainan K. Varghese, Thiruvinal House, Adoor.P.O., Kerala State, 691523, India or to matterdoc@gmail.com

References:

References are self-published by the author. Since, this concept is unprecedented; they are not reviewed or edited.

- [1] Nainan K. Varghese.: *Hypothesis on MATTER* (second edition). BookSurge Publishing, North Charleston, NC. (2008)
- [2] Nainan K. Varghese. : *Gravitation*. CreateSpace (On-demand publishing Company), Scotts Valley, CA. (2010).
- [3] Nainan K. Varghese, ARTICLES, <http://matterdoc.hdfree.in>

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