LOGIC OF 'PUSH GRAVITY'

According to 'MATTER (Re-examined)'

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Abstract: An all-encompassing universal medium, made of 'real' matter particles, fills the entire space outside 'basic 3D matter-particles'. It is homogeneous, isotropic, and self-stabilizing multiple-entity. Because of its inherent compression, it squeezes all 'basic 3D matter-particles' by direct contact. This all-around push action on basic 3D matter-particles by the universal medium is 'gravitation'. The strength of gravitation is proportional to the extent of the universal medium, away from the point of action. The extent of universal medium on the outer-sides of two basic 3D matter-particles is always more (with correspondingly higher gravitation) than the extent of universal medium in between them (with correspondingly lower gravitation). Greater pushes from outer-sides and lower pushes from in between, compel the basic 3D matter-particles to move towards each other. The cause of this motion appears as an 'attraction' between the basic 3D matter-particles. This phenomenon is interpreted as 'gravitational attraction' between them. 'Gravitational attraction' is a minor by-product of separate gravitational push-actions on each of the basic 3D matter-particles. The magnitude of gravitational attraction between two macrobodies is the resultant of gravitational attractions between their constituent basic 3D matter-particles. It is the differences in extents of universal medium on either side of constituent basic 3D matter-particles that produce gravitational attraction between two macrobodies, rather than shadow-effects on each other.
Keywords: Gravitation, gravitational attraction, universal medium, push gravity.

Introduction:

The mechanism of 'gravitational attraction' is one of the most baffling problems in 'Natural Philosophy'. Unlike many other complex phenomena, 'gravitational attraction' is a common experience of everyday life that requires no special equipment, experimental analysis, or skill to recognize its presence and action. 'Gravitational attraction' influences every aspect of the universe and our lives. Yet, despite great advances in theoretical and experimental physics, we do not know anything certain about the definitive nature of this phenomenon. Many hypotheses had been advanced to deal with various aspects of 'gravitational attraction'. However, despite the great accuracy of its quantitative analysis, none of these hypotheses could offer full and logical explanations to all aspects of 'gravitational attraction'.

'Gravity' or 'gravitational attraction' is usually defined as a 'force' that draws objects towards each other. It is a kinetic phenomenon. Currently, we know nothing about static functions of gravitation. 'Attraction theory of Gravity', basically, infers that all material bodies emit some kind of particles, vibration waves, or other forms of signals, which another material body receives and responds to by moving itself towards the source. Self-motivation of the receiving body in a direction opposite to the impacts by imaginary particles, vibration waves, or other forms of signals is mystifying and against the basic dynamic laws. Pull-nature of an effort ('force') is against all scientific wisdom and common sense.

Currently, the 'gravitational force' between two three-dimensional material bodies is assumed to be of 'pull-nature'. Efforts, corresponding to their masses (equivalents of their 3D matter-contents), are assumed to emanate

from both 3D material bodies to pull at each other. No logical mechanism for this action is known. Relativity theories put the burden of gravity on the curvature of an imaginary concept, the 'space-time' and 'Quantum gravity' puts the burden of gravity on mysterious 'particle fields'. They also do not give logical, mechanical explanations of gravitational actions. There is absolutely no evidence to show that 'gravity' is a 'pull force'. Instead, the illogical principle of 'actions at a distance through empty space' is borrowed from 'Newtonian mechanics' to assume the attractive nature of actions between two material bodies, approaching each other under gravitation.

It is absurd to imagine a material body can act on another material body at a distance without mutual contact or without a material medium. 'Gravitational attraction' must be caused by an external agent that is material and in direct contact with all other material bodies in the universe. Objects cannot pull other objects (even with direct contact) through empty space. They can only push other objects through direct contact. Hence, whatever the cause of 'gravitational attraction' is, at the level of the most basic 3D matter-particle, it must be the result of a push mechanism. Philosophers, unwilling to accept the irrational concept of 'action at a distance', advanced many kinds of mechanisms. Obligation to acknowledge laws and characteristics enunciated by Newton or other great scientists significantly restricted the legitimacy of these theories.

In the past, numerous mechanical explanations were advanced to advocate 'push forces' as the cause of 'gravitational attraction' between two macrobodies. 'Push gravity' theories had certain common features. They dealt with motions of 3D material bodies under gravitation, only the kinetic phenomenon of gravitation. Hence, they are collectively known as 'kinetic theories of gravitation' or simply as 'push gravity theories'. They try to explain the action of 'gravitational attraction' with the assistance of simple mechanical processes of certain interconnecting media, without assuming 'action at a distance through empty space'.

The idea that gravity is a 'push force' was first advanced by Nicolas Fatio de Duillier, when he proposed the fundamentals of the 'particle theory of gravity' [2]. This was followed by many (somewhat) similar theories by eminent physicists. A common factor of most of these models is that any two material bodies partially shield each other from undefined ultra-mundane corpuscles, EM waves, photons, or shock/vibration waves (as the case may be), continuously impacting all material objects from all directions. This results in a net imbalance in the impact pressure that tends to move material bodies towards each other. Some other theories blame 'forces' emanating from the sun or centripetal actions of vortexes in an ethereal medium, responsible for the push action on material bodies. A few theories require different types of matter (rough and fine matter) to create gravity. But none of them gave a satisfactory mechanical explanation of the origin of media or actions.

Push gravity theories had inherent defects associated with their initial assumptions. Ultra-mundane (undefined) corpuscles, EM waves, photons, or shock/vibration waves, which were assumed as impact elements, had no reasonable origin. They were simply assumed to exist and act ab initio. Transfer of work (energy) on impact and its effect on the state of material bodies (temperature) were not logically accounted for. Problems of relative motions of gravitating bodies and impacting elements could be solved only by assumptions of superluminal speeds and very minute sizes of impacting elements. Attempts to solve these problems by the introduction of stress in an imaginary 'aether', to substitute impacting elements, were not successful due to a lack of logical physical causes. Briefly, none of them could survive to overcome criticism and gain wider acceptance among physicists.

Eventually, physicists neither knew nor cared how gravity worked. As long as mathematical analyses give desired results, they are happy with the 'pull-nature' of gravity and its 'actions at a distance through empty space'. Wherever this is not convenient for explanations, imaginary intermediaries of actions (like imaginary entities, gravitational fields, gravitational potential, particle fields, space-time continuum, etc.) are substituted instead of 'empty space'. Such requirements call attention to the importance of the possible discovery of an existing universal medium in our universe. Gravitation is closely related to an all-pervading universal medium.

At this juncture, a brief introduction to a humble suggestion, to uphold the 'push nature' of 'attraction due to gravity', as given in an alternative concept, is presented here. This concept is based on only one assumption that 'Substance is fundamental and matter alone provides substance to all real entities'. It envisages 'gravitation' as an inherent property of an all-pervading universal medium (made of 'real' unstructured matter-particles) and 'gravitational attraction' between two 3D material bodies as an apparent effect that is a minor by-product of

gravitational pressures on any two 3D material bodies. All statements and conclusions expressed in this article are from the book, 'MATTER (Re-examined)' [1]. For details, kindly refer to the same.

Universal medium:

An alternative concept, presented in the book 'MATTER (Re-examined)', envisages matter as the sole substance that provides positive existence and objective reality to all physical entities. Matter exists in the form of minute, unstructured matter particles called 'quanta of matter'. Quantum of matter is the only 'postulated entity' in this concept. No other virtual or imaginary entities or mysterious properties are used. By the inherent property of unstructured matter, free quanta of matter tend to reduce their existence to the minimum spatial dimensions. In their single-dimensional status, quanta of matter form two-dimensional lattice structures in all possible planes in space. In this way, they coexist at the points of intersection and fill the entire space without voids. Separate latticework structures by quanta of matter in all possible planes, together, form an all-encompassing universal medium. Actions in or by each latticework structure are limited to its own plane. Simultaneous actions in or by all latticework structures of the universal medium, in a region, appear as an action in 3D space. Universal medium is a self-stabilising, homogeneous and isotropic continuum that fills the entire space outside 'basic 3D matter-particles', without voids. In general, the universal medium is steady in space, and hence, any point in this physical entity can provide an absolute reference. Although it is formed by rigid quanta of matter, due to its latticework structure, it has all the properties of an ideal fluid. Since the universal medium fills the entire space, outside basic 3D matter-particles, it permeates all superior 3D material bodies, whose structure (by basic 3D matter-particles) provides a lot of space, unoccupied by 3D matter.

Each plane, in space, has a separate and independent latticework structure by quanta of matter. Each latticework structure extends in all directions in its plane to infinity and is inherently in a compressed state. Availability of free quanta of matter and frequent local breakdowns of latticework structures provide ample opportunity for free quanta of matter to infiltrate into them. Frequent migration of free quanta of matter into the latticework structures keeps the universal medium under compression even without a definite border (container). Local breakdowns (due to various reasons) in any part of the universal medium release quanta of matter from its latticework structures. A gap is formed at the site of breakdown, with recently released free quanta of matter in it. The fabric of the universal medium from all around (being under compression) moves towards the centre of the gap, to re-establish its continuity. Due to its inward radial motion, caused by the compressed state, the universal medium presses on any physical object present in the gap and compresses it. This phenomenon is the 'gravitation', and it is a property of the universal medium. The magnitude of gravitational effort at a point is proportional to the extent of the universal medium in the direction from which gravitational effort is acting.

Due to their inherent properties, free-floating quanta of matter in a gap (created by a recent breakdown of the universal medium) try to migrate into their parent latticework structure. However, due to the reduction of the gap, the area available for reformation of the damaged part of the universal medium becomes insufficient to accommodate all available free quanta of matter. Universal medium, encroaching into the gap, gathers all available free quanta of matter and compresses them into a single but combined 2D material body. Simultaneous and similar actions in all latticework structures, in all planes passing through the gap, gather and compress available free quanta of matter in the gap and mould them into a single 3D matter-particle. This is the stage of creation of 3D matter from 1D quanta of matter. 3D matter-core, created by the gravitational action of the universal medium, is further moulded and moved as required by mechanical interactions between it and the structurally distorted region in the surrounding universal medium. In its stable state, 3D matter-core created by gravitational action is a segmented spherical (disc-shaped) 3D material body that spins about one of its diameters and moves at a critical constant linear speed with respect to the steady universal medium. These 3D matter-cores have uniform radial size, but their thicknesses are proportional to their 3D matter-contents.

3D matter-core (created and sustained by the universal medium) and the associated (moving) structural distortions in the surrounding universal medium, together, form a basic 3D matter-particle, called a photon. A photon has 3D matter as its corpuscular core and associated structural distortions (that have many similarities with EM waves) in the surrounding universal medium. The spin speed (frequency) of a photon is proportional to its 3D matter-content. Linear speed of a photon (component of light or similar radiations) is a critical constant because

that is the highest linear speed at which the universal medium can move 3D matter-particles, without causing its own breakdown. The magnitude of this critical linear speed in any region depends solely on the nature of the universal medium in that region of space. An attempt to increase the linear speed of a photon results in increasing its 3D matter-content (frequency) rather than its linear speed. Similarly, attempting to reduce the linear speed of a photon results in reducing its 3D matter-content (frequency) rather than its linear speed. Continuous flow of photons creates light or other forms of (matter) radiation with associated (energy) work. 3D matter-core with EM wave-like structural distortions in the surrounding universal medium bestows a photon (light) with its dual nature. All aspects of a photon are regulated, stabilised, and sustained by gravitation from the universal medium.

Latticework structures of universal medium impose certain limitations on gravitational actions. Gravitation is unable to act on flat surfaces or straight perimeters of basic 3D matter-particles. Hence, a major part of the gravitational action on the 3D matter-core of a photon is limited to its circular periphery. Disc-faces of photon's core-body receive only slight gravitational actions, appropriate to their very small curvatures. However, these are sufficient to sustain photon's spin-speed (corresponding to 3D matter-content) and its constant linear speed.

Photons are the most basic 3D matter-particles. Under suitable conditions, universal medium compels two complementary high-frequency photons to combine as a binary unit to form a 'primary 3D matter-particle' – the 'biton'. In a biton, constituent photons rotate about each other in a common circular path, while spinning about a diameter of their circular path. They move at their critical speeds; the only difference being that the direction of their linear motion is curved along the periphery of the biton. Two bitons may be bound by gravitation to form a single unit by placing themselves in mutually perpendicular planes about a common centre. Such a 3D matter-particle has four constituent photons and may be called a 'tetron'. A group of tetrons, formed as a spherical shell, is a neutron. By gravitation, three bitons (in mutually perpendicular planes about a common centre) may form a union called a 'hexton'. Depending on the nature of structural distortions in the surrounding universal medium, hextons are of two types - 'positrons' and 'electrons'. A spherical shell, formed by tetrons about a positron, is a 'proton'. A union of two spherical shells by tetrons about a common positron, together, is a 'deuteron' (currently counted as one proton plus one neutron). Further developments to superior 3D matter-particles and macrobodies and their sustenance are all guided and accomplished by the gravitation of the universal medium.

Universal medium has an inherent property to stabilise itself so that, on average, it is homogeneous, isotropic and serene. Therefore, any structural distortion of its latticework structure is transferred from a high distortion-density region to a low distortion-density region. During the transfer of latticework distortions in the universal medium, 3D matter-particles in that region are also carried along with the structural distortions. This mode of displacement of a 3D matter-particle is 'inertial motion' (displacement that causes the property of inertia). Inertia is a property of the universal medium. Movement of structural distortions in the latticework structures in the universal medium and associated motion of corresponding 3D matter-particles continues indefinitely, unless the magnitude and direction of structural distortions are modified or removed by additional structural distortions in an appropriate direction. A macrobody contains millions of photons, each one moving in circular paths within a superior 3D matter-particle. Transfer of structural distortions in latticework structures through the universal medium within the region of a macrobody causes additional displacement of photons by deflecting their paths, corresponding to the direction and speed of the distortion-transfer. Resultant displacements of constituent photons, together, cause the inertial motions of a macrobody in space.

In order to preserve the integrity and state of motion of a 3D material body, the universal medium in its immediate surroundings is structurally distorted in a peculiar way, unique to that type of 3D material body. This region is the 'distortion-field' or 'matter-field' of that 3D material body. Interactions between different distortion-fields may cause 'apparent attraction' or 'apparent repulsion' of the associated 3D material bodies. There are no interactions directly between the concerned 3D material bodies, but each of them is moved towards or away from the others by actions of structural distortions in the latticework structures of the universal medium, which are in direct contact with (constituent photons of) 3D material bodies. In either case, inertial motions of 3D material bodies are affected by the transfer of structural distortions in the universal medium from a region of higher distortion-density to a region of lower distortion-density. Inertial motions, towards each other, appear as the results of 'pull forces' and are interpreted as an 'attraction'. Inertial motions, away from each other, appear as results of 'push forces' and are interpreted as a 'repulsion'. Gravitation, manifested in different situations, is

understood as different 'natural forces'. Hence, there is only one type of 'natural force', which is currently classified into different types of 'natural forces', according to the phenomena they are associated with.

Since the universal medium is in direct contact with the 3D matter-core of every photon, gravitation is applied directly onto the photons' 3D matter-cores. All superior material bodies are made up of combinations of photons. Therefore, gravitational actions are not applied to the macrobodies as a whole, but to each of their constituent photons, separately.

Gravitational attraction:

'Gravitational attraction' is a misnomer. Gravitation, being a push action, cannot cause attraction. Gravitation tends to push any 3D material body away from the point of its action. Simultaneous and resultant actions of gravitation on two 3D matter-particles cause their displacements towards each other. This appears as a single action of attraction between the 3D matter-particles. Hence, the term 'gravitational attraction' is continued in this concept to denote the apparent nature of dynamic gravitational actions on 3D material bodies.

3D matter is inert. Hence, there can be no innate ability in it to cause an effort (force), in nature. All actions between two 3D material bodies are the result of gravitational actions by the universal medium. As 3D matter-particles break the continuity of the universal medium, all photons are 'disturbances' in the universal medium. Hence, the surrounding universal medium continuously applies gravitation on them from all directions. Gravitation on (almost flat) disc-faces of photons, being too small, may be neglected for the time being. Magnitude of gravitation at any point on the periphery of a photon's 3D matter-core is proportional to the extent of universal medium, away from that point, in its plane. When a single photon exists free in space, the extent of the universal medium, away from any point on its periphery, is the extent of the universal medium in space, which is infinite. Correspondingly, the magnitude of gravitation at every point on the circular periphery of the 3D matter-core of a photon is the highest that the universal medium of infinite extent can provide.

If there are two photons, disc planes of whose 3D matter-cores coincide in the same plane, the extent of the universal medium between them is limited to the distance between their peripheries. Therefore, the magnitudes of gravitation on the 3D matter-cores of photons from this direction correspond only to the extent of the universal medium between them, which is less than the magnitudes of gravitation on their outer-sides. Higher gravitation on the outer-sides and lesser gravitation from between produce resultant efforts (force) on the 3D matter-cores of the photons to move them towards each other (without altering their natural motions). The tendency to move towards each other, under higher push efforts from their outer sides, creates the appearance that these photons are attracting each other. This apparent phenomenon is 'gravitational attraction', and it is generated by direct and separate push actions (gravitation) by the universal medium, on each of the participating 3D matter-cores of the photons. Gravitational attraction between two 3D matter-particles is caused by limiting the extent of the universal medium between their 3D matter-cores rather than by their shadows on each other.

Since photons have extremely thin disc-shaped 3D matter-cores and they spin (about one of their diameters) at very high frequency, gravitational attraction between two photons in macrobodies lasts only for a very brief period. Even a very small macrobody has millions of photons in it, all spinning about their diameters and simultaneously rotating in the binary systems of bitons. At any instant, only a very small minority of photons in each of the macrobodies are subject to the gravitational attraction between them. The total average magnitude of gravitational attraction between two macrobodies is sustained by numerous sporadic gravitational attractions between photons in one macrobody and photons in the other macrobody. Generally, the magnitude of gravitational attraction between two macrobodies is extremely small compared to the magnitude of gravitation on any of their constituent photons. Although gravitation is enormously strong (compared to other manifestations of 'natural forces'), gravitational attraction between macrobodies appears extremely weak.

Since the universal medium extends infinitely, wherever two photons happen to be, there is gravitational attraction between them, whenever disc-planes of their 3D matter-cores coincide in the same plane. All macrobodies are structured by high-frequency photons. Disc-shaped 3D matter-cores of the same spinning photons in two macrobodies come in the same plane to contribute towards gravitational attraction between the macrobodies. Hence, irrespective of where or how far two macrobodies are situated, they are always under an average gravitational attraction towards each other. This makes gravitational attraction a universal phenomenon,

unlimited in range. However, at extremely small distances between two photons, the structural behaviour of the universal medium controls certain aspects of gravitational attraction.

Gravitational attraction is between individual photons in two macrobodies. That is, each photon in one macrobody is accelerated towards another photon in the other macrobody, corresponding to the magnitude of gravitational attraction between them. Despite the number of photons in macro bodies (3D matter-contents/rest masses), every photon in both macrobodies accelerates at the same rate, which is the same as the acceleration of the macrobodies. Therefore, irrespective of their masses, sizes, shapes or consistency, every macrobody near Earth has the same acceleration due to gravity towards Earth's surface.

The peculiarity of the mechanism of gravitational attraction (due to the latticework structure of the universal medium and the structure of photons) may cause what may be considered anomalous by current understandings. Common attributes of 'gravitational attraction' between two macrobodies, according to the proposed concept, may be tabulated as follows.

1) Gravitational attraction between two macrobodies is an apparent effort derived from the resultants of separate push efforts on each of them, by the universal medium.

2) The magnitude of gravitational attraction between two macrobodies is very minute compared to the magnitude of gravitation on any of their constituent photons.

3) Magnitude of gravitational attraction between two macrobodies is the total average sum of gravitational attractions between the constituent photons in one body and the constituent photons in the other body, disc-planes of whose 3D matter-cores happen to be in the same planes at any instant. Numerous and sporadic gravitational attractions between the photons in both macrobodies give an average and continuous gravitational attraction between them.

4) Resultant gravitational attraction between two macrobodies is along a straight line joining their 'centres of gravity'. The direction of gravitational attraction is not affected by the structure or shape of macrobodies.

5) The 3D matter-content of a macrobody is proportional to the number of photons in it. Hence, the magnitude of gravitational attraction between two macrobodies is proportional to their 3D matter contents (equivalents of which are provided by their rest masses).

6) In the 3D spatial system, gravitational attraction is analogous to outward radiation in spherical space from a point source. Hence, the magnitude of gravitational attraction reduces in proportion to the inverse square of the distance between the centres of gravity of two macrobodies. However, gravitational attraction being an action in the 2D spatial system, when considering very small 3D matter-particles at close range (or in great detail), its magnitude reduces in inverse proportion to the distance between peripheries of 3D matter-cores of their constituent photons.

7) Every photon is constantly under the influence of gravitation by the universal medium. As long as two photons are in existence, gravitational attraction between them is present whenever the disc-planes of their 3D matter-cores coincide. Changes in the parameters of one or both photons instantly modify the magnitude of gravitational attraction between them. No new effort is generated or transmitted, but the existing effort is modified, along with changes in parameters. Therefore, action by gravitational attraction is instantaneous.

8) The magnitude of gravitational attraction between two 3D matter-particles depends only on the extent of the universal medium between them, and hence gravitational attraction between them cannot be screened by the presence of intervening entities. Since gravitational actions on outer sides cause motion of 3D matter-bodies towards each other, intervening entities cannot reflect, refract, or in any way deflect the line of action of gravitational attraction. Theoretically, gravitational attraction between two photons may be screened by a larger 3D material body of 3D matter-density equal to or more than that of a photon's 3D matter-core, placed between them. However, a non-spinning 3D material body larger than the 3D matter-core of a photon is impossible in nature.

9) Latticework structures of universal medium prevent gravitation from producing inertial action on a flat surface or a straight-line perimeter of 3D matter-cores of photons. Therefore, there is no gravitational attraction between two photons unless the disc-planes of their 3D matter-cores coincide.

10) Time has no effect whatsoever on the magnitude of gravitational attraction between two macrobodies. If their parameters can be kept constant, the magnitude of gravitational attraction between them remains constant, irrespective of the passage of time.

11) The magnitude of gravitational attraction depends only on the total 3D matter-content of a macrobody. Macrobody's shape, size, consistency, homogeneity, density or any other similar parameters do not affect it.

12) Inasmuch as the mass (total 3D matter-content) of a macrobody is not affected, the magnitude of gravitational attraction is not affected by changes in its structure, chemical decomposition, linear speed, magnetism, electrostatic charge, etc. However, the temperature of a macrobody being closely related to its 3D matter-content level; changes in the temperature of a macrobody has its effects (though very minute) on the magnitude of gravitational attraction.

13) Although a single isolated 3D material body is under gravitation, it takes at least two 3D material bodies to develop gravitational attraction. Gravitation on a single 3D material body is a static activity, and gravitational attraction between two 3D material bodies is a dynamic activity. Within a macrobody, gravitational attraction exists between each of its constituent photons. Structural distortions, in the surrounding universal medium, are essential to maintain the integrity and state of motion of any type of 3D matter-body.

14) The main purpose of gravitation is to create 3D matter, sustain 3D matter-particles and sustain macrobodies in stable states. The gravitational attraction between two 3D matter-particles is a by-product of gravitation on them. Gravitational attraction can be recognised only by its inertial actions (actions that cause inertia) on participating 3D material bodies.

Conclusion:

Gravitation is a property of an all-encompassing universal medium that fills the entire space, outside basic 3D matter-particles (photons). Gravitational attraction between two 3D material bodies is an apparent dynamic action of gravitation, produced by the resultants of separate 'gravitational push efforts' on them. It is the difference in extent of universal medium between two 3D material bodies and the extents of universal medium on their outer-sides, which causes the resultant push actions to move them towards each other, rather than a mutual shadow-effect from assumed entities.

Reference:

[1] Nainan K. Varghese.: *MATTER (Re-examined),* https://www.matterdoc.in/

[2] Articles on *Kinetic theories of gravity,* http://en.wikisource.org/wiki/

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