

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 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 universal medium is 'gravitation'. Strength of gravitation is proportional to the extent of universal medium, away from the point of action. Extent of universal medium on outer-sides of two basic 3D matter-particles is always more (with correspondingly higher gravitation) than extent of universal medium in between them (with correspondingly lower gravitation). Greater pushes from outer-sides and lower pushes from in between, compel basic 3D matter-particles to move towards each other. Cause of this motion appears as 'attraction' between 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 basic 3D matter-particles. Magnitude of gravitational attraction between two macro bodies 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 macro bodies, rather than shadow-effects on each other.

Keywords: Gravitation, gravitational attraction, universal medium, push gravity.

Introduction:

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, which requires no special equipments, experimental analysis or skill to recognize its presence and action.

'Gravitational attraction' influences every aspect in universe and our life. Yet, despite great advances in theoretical and experimental physics, we do not know anything certain about definitive nature of this phenomenon. Many hypotheses had been advanced to deal with various aspects of 'gravitational attraction'. However, despite 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 it by moving itself towards the source. Self-motivation of receiving body in direction, opposite to impacts by particles, vibration waves or other forms of signals is mystifying and against basic dynamic laws. Pull nature of an effort ('force') is against all scientific wisdom and common sense.

Currently, 'gravitational force' between two three-dimensional matter-bodies is assumed as of 'pull-nature'. Efforts, corresponding to their masses (equivalents of their matter-contents), are assumed to emanate from both 3D matter-bodies to pull at each other. No logical mechanism for this action is known. Relativity theories put burden of gravity on curvature of an imaginary concept, 'space-time' and 'Quantum gravity' puts onus of gravity on mysterious 'particle fields'. They also do not give logical mechanical explanations on gravitational actions. There is absolutely no evidence to show that 'gravity' is a 'pull force'. Instead, illogical principle of 'actions at a distance through empty space' is borrowed from 'Newtonian mechanics' to assume attractive nature of actions between two matter-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 universe. Objects cannot pull other objects (even with direct contact) through empty space. They can only push other objects through direct contacts. Hence, whatever be the cause of 'gravitational attraction' is, at the level of most basic 3D matter-particle, it must be the result of a push mechanism. Philosophers, unwilling to accept irrational concept of 'action at a distance', advanced many kinds of mechanism. Obligation, to acknowledge laws and characteristics enunciated by Newton or other great scientists, significantly restricted legitimacy of these theories.

In the past, numerous mechanical explanations were advanced to advocate 'push forces' as the cause of 'gravitational attraction' between two macro bodies. 'Push gravity' theories had certain common features. They dealt with motions of 3D matter-bodies under gravitation – only kinetic phenomenon of gravitation. Hence, they are collectively known as 'kinetic theories of gravitation' or simply as 'push gravity theories'. They try to explain action of 'gravitational attraction' with 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 'particle theory of gravity' [2]. This was followed by many (somewhat) similar theories by eminent physicists. 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 impact pressure that tends to move matter bodies towards each other. Some other theories blame, 'forces' emanating from sun or centripetal actions of vortexes in an ethereal medium, responsible for push action on material bodies. Few theories required different types of matter (rough and fine matters) to create gravity. But none of them gave satisfactory mechanical explanation on 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 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 introduction of stress in imaginary 'aether', to substitute impacting elements, were not successful due to lack of logical physical causes. Briefly, none of them could survive to overcome criticism and gain wider acceptance among physicists.

Eventually, physicists neither know nor cared how gravity worked. As long as mathematical analyses give desired results, they are happy with '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 importance of 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 '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 matter-bodies as an apparent effect that is a minor by-product of gravitational pressures on any two 3D matter-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:

Alternative concept, presented in book 'MATTER (Re-examined)', envisages matter as sole substance that provides existence and objective reality to all physical entities. Matter exists in the form of minute unstructured 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 inherent property of unstructured matter, free quanta of matter tend to reduce their existence into minimum spatial dimensions. In their single-dimensional status, quanta of matter form two-dimensional latticework-structures in all possible planes in space. In this way, they co-exist at points of intersections and fill entire space without voids. 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 universal medium, in a region, appears as an action in 3D space. Universal medium is a self-stabilizing, homogeneous and isotropic continuum that fills entire space outside 'basic 3D matter-particles', without voids. In general, 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 properties of an ideal fluid. Since universal medium fills entire space, outside basic 3D matter-particles, it permeates all superior 3D matter-bodies, whose structure (by basic 3D matter-particles) provides 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 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 latticework-structures, keep universal medium under compression even without a definite border (container). Local breakdowns (due to various reasons) in any part of universal medium releases 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. Fabric of universal medium from all around (being under compression) moves towards

the centre of gap, to re-establish its continuity. Due to its inward radial motion, caused by compressed state, universal medium presses on any physical object present in the gap and compresses it. This phenomenon is 'gravitation' and it is a property of universal medium. Magnitude of gravitational effort at a point is proportional to extent of universal medium in the direction from where gravitational effort is acting.

Due to their inherent properties, free floating quanta of matter in a gap (created by a recent breakdown of universal medium) try to migrate into their parent latticework-structure. However, due to reduction of gap, area available for re-formation of damaged part of 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 matter-body. Simultaneous and similar actions in all latticework-structures, in 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 gravitational action of universal medium is further moulded and moved as required by mechanical interactions between it and distorted region in surrounding universal medium. In its stable state, 3D matter-core created by gravitational actions, is a segmented spherical (disc) shaped matter core-body that spins about one of its diameter and moves at a critical constant linear speed with respect to steady universal medium. They have uniform radial size but their thicknesses are proportional to matter-contents.

3D matter-core (created and sustained by universal medium) and associated (moving) distortions in surrounding universal medium, together, form a basic 3D matter-particle, called photon. A photon has 3D matter as its corpuscular core and associated distortions (that has many similarities with EM waves) in surrounding universal medium. Spin-speed (frequency) of a photon is proportional to its 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 universal medium can move 3D matter-particles, without causing its own breakdown. Magnitude of this critical linear speed in any region depends solely on nature of universal medium in that region of space. Attempt to increase linear speed of a photon results in increasing its matter-content (frequency) rather than its linear speed. Similarly, attempt to reduce linear speed of a photon results in reducing its 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 distortions in surrounding universal medium bestows a photon (light) with its dual nature. All aspects of a photon is regulated, stabilized and sustained by gravitation from 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, major part of gravitational action on 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 matter-content) and its constant linear speed.

Photons are the most basic 3D matter-particles. Under suitable conditions, universal medium compels two complimentary 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 common circular path, while spinning about a diameter of their circular path. They move at their critical speeds; only difference being that direction of their linear motion is curved along periphery of biton. Two bitons may be bound by gravitation to form a single unit by placing themselves in perpendicular planes. 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 (each biton in plane perpendicular to others) may form a union called a 'hexton'. Depending on nature of distortions in surrounding universal medium, hextons are of two types - 'positrons' and 'electrons'. A spherical shell, formed by tetrons about a positron, is a 'proton'. Two spherical shells, formed by tetrons about a common positron, is a 'deuteron' (currently counted as one proton plus one

neutron). Further developments to superior 3D matter-particles and macro bodies and their sustenance are all guided and accomplished by gravitation of universal medium.

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

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

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

Gravitational attraction:

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

3D matter is inert. Hence, there can be no innate ability in it to cause an effort (force), in nature. All actions, noticed between two 3D matter-bodies, are results of gravitational actions by universal medium. As 3D matter-bodies break continuity of universal medium, all photons are 'disturbances' in universal medium. Hence, surrounding universal medium continuously apply 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 periphery of a photon's matter-core is proportional to extent of universal medium, away from that point, in its plane. When a single photon exists free in space, extent of universal

medium, away from any point on its periphery, is the extent of universal medium in space, which is infinite. Correspondingly, magnitude of gravitation at every point on photon's circular periphery is highest that universal medium of infinite extent can provide.

If there are two photons, whose disc planes coincide in same plane, extent of universal medium between them is limited to distance between their peripheries. Therefore, magnitudes of gravitation on matter-core of photon from this direction correspond only to the extent of universal medium between them, which are lesser than magnitudes of gravitation on their outer-sides. Higher gravitation on outer-sides and lesser gravitation from between produce resultant efforts (force) on matter-cores of photons to move them towards each other (without altering their natural motions). Tendency to move towards each other, under higher push efforts from outer-sides create 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 universal medium, on each of the participating matter-cores of photons. Gravitational attraction, between two 3D matter-bodies is caused by limiting extent of universal medium between their constituent photons rather than by their shadows on each other.

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

Since universal medium extends infinitely, wherever two photons happen to be, there is gravitational attraction between them, whenever disc-planes of their matter-cores coincide in same plane. All macro bodies are structured by high frequency photons. Disc-shaped matter-cores of spinning photons in two macro bodies often come in same plane to subscribe towards gravitational attraction between macro bodies. Hence, irrespective of where or how far two macro bodies are situated, they are always under gravitational attraction towards each other. This makes gravitational attraction, a universal phenomenon, which is unlimited by range. However, at extremely small distances between two photons, structural behaviour of universal medium control certain aspects of gravitational attraction.

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

Peculiarity of mechanism of gravitational attraction (due to latticework-structure of universal medium and structure of photons) may, at times, cause what may be considered as anomalous by current understandings. Common attributes of 'gravitational attraction' between two macro bodies, according to proposed concept, may be tabulated as follows.

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

2) Magnitude of gravitational attraction between two macro bodies is very minute compared to magnitude of gravitation on any of their constituent photons.

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

4) Resultant gravitational attraction between two macro bodies is along a straight line joining their 'centers of gravity'. Direction of gravitational attraction is not affected by structure or shape of macro bodies.

5) Matter-content of a macro body is proportional to number of photons in it. Hence, magnitude of gravitational attraction between two macro bodies is proportional to their matter contents (equivalences of which are provided by their rest masses).

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

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

8) Magnitude of gravitational attraction between two 3D matter-bodies depends only on the extent of universal medium between them and hence gravitational attraction between them cannot be screened by 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 line of action of gravitational attraction. Theoretically, gravitational attraction between two photons may be screened by a larger 3D matter-body of matter-density equal to or more than that of a photon, placed between them. However, a non-spinning 3D matter-body larger than a photon is impossibility in nature.

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

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

11) Magnitude of gravitational attraction depends only on total matter-content of a macro body. Macro body's shape, size, consistency, homogeneity, density or any other similar parameters do not affect it.

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

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

14) Main purpose of gravitation is to create 3D matter and sustain 3D matter-bodies in stable states. Gravitational attraction between two 3D matter bodies is a by-product of gravitation on them. Gravitational attraction can be recognized only by its inertial actions (action that causes inertia) on participating 3D matter-bodies.

Conclusion:

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

Reference:

- [1] Nainan K. Varghese.: *MATTER (Re-examined)*, <http://www.matterdoc.info>
- [2] Articles on *Kinetic theories of gravity*, <http://en.wikisource.org/wiki/>

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