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An Analysis on Laws of Motion in Universe

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Posthumous Research Paper of Mr. Baldev Singh Jhawer, M. A., B. Ed. of Jhawan, Hoshiarpur MBA, Former Science Teacher, Punjab Education Department

Abstract – According to theory of relativity matter & space that interacts with each other. As it is explained matter tells the space how to bend & space tells the matter how to move. But the question arises that how these interact. There exists a particle whose speed when at arrest is equal to the speed of light. Let call this particle A Space Particle & in short we can call this Space Particle "Sp". These Sp's are everywhere in the space. When space & matter interact with each other and matter changes the density of these space particles. Density of these particles decreases near the matter & increases as we move away from the matter.

Keywords: Laws of Motion, Universe, Fundamental Force, Density

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1. INTRODUCTION

Everything in the Universe is in motion, because forces exist in the Universe. The gravitational force and the electromagnetic force ensure large objects are in motion while the weak and strong nuclear forces ensure the quantum & world is constantly in motion. If there were no forces, there would be no motion [3].

The question is why there are forces in the Universe? This question is currently unanswerable by science. It appears to be fundamental and demonstrable facts but there may not be an ultimate reason for their existence, just as there may not be a root cause for the existence of the Universe itself.

A body moves in space from higher density points to lower density points. Thus it is the structure of the space which is fourth fundamental force from which the gravity is derived. We know that when body falls towards earth its acceleration is equal to the g & when body is thrown away from earth it also de-accelerate with a g. Thus the density of space particles near earth's surface is less and increases as we move away from the surface of the earth.

Thus the density of these space particles is inversely proportional to g. Let's call the density of these particles Sd..& call this density as space density

This Sd oc h/g (g=Gm/R2)

Or Sd oc R2/Gm

{R = radious, G = Gravity, Sd = Space Density, m = mass}

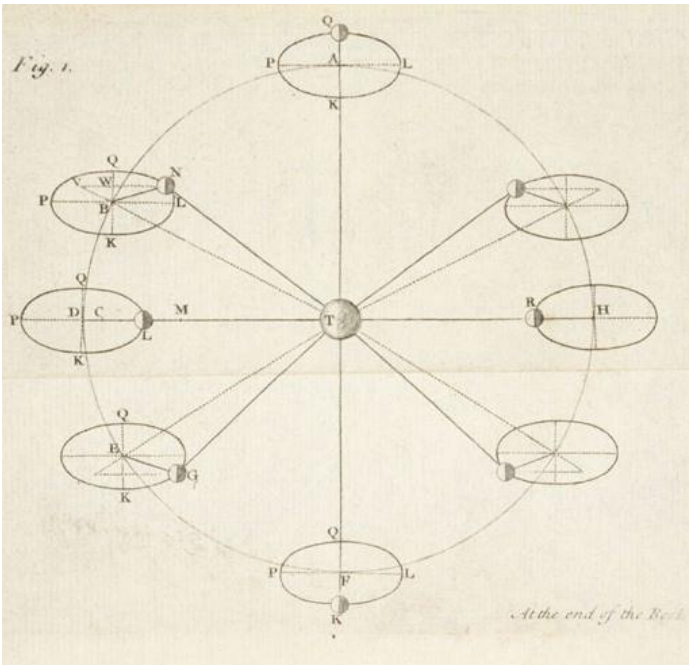
So the Sd is directly proportional to square of distance from the centre of a body & inversely proportional to mass of the body. Gravitational field- Distribution of space particles around the centre of mass of a body forms the gravitational field of that body. Thus when matter & space interact, matter changes the density of space & due to change in space density a body moves from higher space density towards lower space density.

2. REVIEW OF LITERATURES

Laws of Motion and Gravity

Newton's most critical book was composed in Latin; its title was translated as **Mathematical Principles of Natural Philosophy (1687)**. It turned out to be a standout book amongst the most powerful works ever done in the history. In its pages **Newton** declared the three Laws of Motion, explained **Johannes Kepler's Laws of Motion**, and expressed the Law of Universal Gravitation. The book is fundamentally a numerical work, in which **Newton** created and connected analytics, the arithmetic of progress, which enabled him to comprehend the movement of divine bodies. To achieve his decisions he additionally utilized precise perceptions of planetary movement, which he made

by planning and building another sort of telescope, one that utilized mirrors to reflect, as opposed to focal points to refract, light.



Source [3]

Isaac Newton (1642-1726) [1]

- **1st law:**

Everyone proceeds in its condition of rest, or of uniform movement in a straight line, unless it is constrained to change that state by powers that have urged it.

- Newton's First Law of Motion, interpreted from the Principia Latin, This is here and there called the Law of Inertia, or just idleness. Basically, it makes the accompanying two points [4]:

- An question that isn't moving won't move until the point when a power follows up on it.
- An protest that is in movement won't change speed (counting halting) until the point that a power follows up on it.

The main point appears to be moderately evident to a great many people; however the second may take some reasoning through, on the grounds that everybody realizes that things don't continue moving until the end of time. On the off chance that I slide a hockey puck along a table, it doesn't move always, it eases back and in the end grinds to a halt. In any case, as per Newton's laws, this is on the grounds that a power is following up on the hockey puck and, beyond any doubt enough, there is frictional power between the table and the puck, and that frictional power is toward the path inverse the development. It's this power which makes the protest ease back to a stop. In the nonappearance (or virtual nonattendance) of such a power, as on an air hockey table or ice arena, the puck's movement isn't blocked [5-6].

Without a net power following up on it, a protest moves with steady speed – Momentum (= mass x speed) of a body is consistent without a net power.

- **Second law:**

A container with a mass of 40 kg sits very still on a frictionless tile floor. With your foot, you apply a 20 N drive an even way. What is the speeding up of the crate?

The question is very still, so there is no net power aside from the power your foot is applying. Grating is disposed of. Additionally, there's just a single course of power to stress over. So this issue is extremely direct.

You start the issue by characterizing your organized framework. For this situation, that is simple - the + x bearing will be the heading of the power (and, hence, the course of the increasing speed). The science is also clear:

$F = m * a$

$F/m = a$

$20\ N/40\ kg = a = 0.5\ m/s^2$

The issues in view of this law are actually unending, utilizing the equation to decide any of the three esteems when you are given the other two. As frameworks turn out to be more mind boggling, you will figure out how to apply frictional powers, gravity, electromagnetic powers, and other material powers to a similar fundamental formula[2].

Newton's Third Law of Motion [2]

To each activity there is constantly contradicted an equivalent response; or, the common activities of two bodies upon each other are constantly equivalent, and coordinated to opposite parts.

- Newton's Third Law of Motion, interpreted from the Principia's Latin

We speak to the Third Law by taking a gander *{taking a look}* at two bodies A and B that are cooperating to each other.

We characterize FA as the power connected to body A by body B and FA as the power connected to body B by body A. These powers will be equivalent in extent and inverse in course. In numerical terms, it is communicated as:

FB = - FA

or then again

FA + FB = 0

{FA & FB represent the forcesexerted}

This isn't an indistinguishable thing from having a net power of zero, nonetheless. On the off chance that you apply a power to a void shoebox sitting on a table, the shoebox applies an equivalent power back on you. This doesn't sound comfortable - you're clearly pushing on the container, and it is clearly not pushing on you. Be that as it may, recollect that, as per the Second Law, power and speeding up are connected - yet they aren't indistinguishable.

Since your mass is substantially bigger than the mass of the shoebox, the power you apply makes it quicken far from you and the power it applies on you wouldn't cause much speeding up at all [7].

Power = Rate of progress in energy – Force = Mass x (Rate of progress in speed) –

Force = Mass x Acceleration

Newton's law of gravity

- Gravitational power between two bodies is given by – Force = (Gravitational steady) x (Mass of question 1) x (Mass of protest 2) isolated by squared separation between two articles.

– F = G M/r2

- Discovery of this law was made conceivable by **Kepler's laws**. – Conflict between **Isaac Newton and Robert Hooke**: "who did it first?" – "In the event that I have seen further, it is by remaining on the shoulders of **goliaths**." - Letter from **Newton to Hooke**

Assembling these laws, **Newton** could express the Law of Universal Gravitation: "Each molecule of issue pulls in each other molecule with a power relative to the result of the majority of the two particles and contrarily corresponding to the square of the separation between them." Stated all the more essentially, the gravitational fascination between two bodies diminishes quickly as the separation between them increments [8-10].

3. FOURTH FANDAMEATEL FORCE

According to the theory of relativity matter & space that interacts with each other. As it is explained that matter tells the space how to bend & space tells the matter how to move. But the question is how these interact. There exists a particle whose speed when at rest is equal to the speed of light. Let call this particle Space Particle & in short Sp. These Sp's are everywhere in the space. When space & matter interact with each other matter changes the density of these space particles. Density of these particles decreases near the matter & increases as we move away from the matter.

A body moves in the space from higher density points to lower density points. Thus it is the structure of the space which is fourth fundamental force from which the gravity is derived. We know that when body falls towards the earth its acceleration is equal to the g *{gravity}* & when body is thrown away from the earth it also de-accelerates with a g *{accelerated gravity}*. Thus the density of space particles near earth surface is less and increases as we move away from the surface of the earth.

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Let us try to understand the motion of a body with the help of space particles. Let there are six particles on left side of the body & four particles on right side of a body. Now the four particles on the right side will give a push to the four particle to the left side and the acceleration of the four particles will be moving to the left side and will be in rest when there another force is applied on the moving particles in the universe or the moving force will keep applying and the particles will keep moving in the universe.

4. END OF THE UNIVERSE

We know that universe is expanding *{big bang theory}*, so the galaxy as well. So it has some point in time when it started expanding & still it is expanding. Thus it limit to some finite space. So universe is not infinite, it has a boundary from which

it is expanding outward; we also know that the speed of galaxies is directly proportional to distance of the galaxy from the center of the universe. Galaxies are accelerating the galaxies. As the universe is finite, the matter in the universe is also finite & the energy produced in the universe could not be infinite & forever & thus the galaxies cannot accelerate forever.

As we move away from the boundary of the universe space density increases. Thus the space density within the universe is lower than space density away from the boundary of the universe. So the galaxies are moving from lower space density to higher space density which is possible only, if the galaxies are receiving more energy than the resistance caused due to the motion of galaxies from lower space density to higher space density. At present rate of production of energy is increasing which result in the acceleration of galaxies.

CONCLUSION

At some point in time to come to the production of energy in the universe will become zero & in turn acceleration of galaxies will also become zero. After that at some time rate of production of energy will become negative & in turn the speed of galaxies will decrease. After that when energy production rate further decreases the galaxies will start moving inward. When the matter in the universe is contained in small volume the increased energy production due to collisions & other nuclear reaction will be so high that it may explode & nuclei of higher atoms may change in nuclei of smaller atoms & fundamental particles. It will start the nuclear reaction again & rate of production of energy starts increasing & universe will start expanding for the next cycle. Thus it is a pulsating universe because Universe first expanded and after the expansion completion; it starts moving inwards and will end in a big crunch & not in ice age.

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