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# Derivation of Newton's law of gravity from Vethathirian concepts

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## Abstract

In this paper, for the first time in the history of science, Newton's Law of Gravity which, so far, remains as deduced from Kepler's laws, has been derived form basic axioms framed using the philosophy of Shri Vedhathri Maharishi. The methodology of the paper is the following: First, mass is defined in terms of its causative factors and using this definition, Newton's law of gravity is derived.

**Keywords :** concepts of inertia, gravity, Newton's law, theory of relativity, Vedhathirian concepts

## INTRODUCTION

Gravity was the first discovered force of the four fundamental forces, but remains least understood. A careful reexamination of Newton's and Einstein's concepts of gravity reveals that mass remains undefined in both. It is precisely for this reason that gravity is still not fully and properly understood. This paper presents an approach to define mass in terms of its causative (kinematic) factors and thereby to reach a deeper understanding of gravitational force.

The most significant aspect of this paper is that Newton's law of gravity which remains so far as deduced, has been for the first time derived here from basic axioms. Again it is for the first time in the history of science that axioms are framed regarding space and from them equations are derived for matter.

This work is based on the axioms originally given by Shri. Vethathiri Maharishi and is therefore called the "Vethathirian Model of the Universe".

### Basic Axioms of the Model

The Newtonian mechanics is well-known to be based on four independent entities namely, space, time, matter and energy. In Einstein's theory of relativity, space and time were unified by the Lorentz transformation and energy and matter were unified by the famous relation $E = m c^2$. Thus while Newton worked with four independents, Einstein worked with two independents (space-time and matter-energy). Following this trend, in this present work complete unification is achieved by identifying space as the unitary entity with the following properties, expressed as the Basic Axioms of the Model (Vethathiri Maharishi, 1996, 2002; Alagar Ramanujam, 2003; Alagar Ramanujam *et al.,* 2004).

*1. Space is the all-pervading substance inherent with all potential energy and consciousness; it has the property of self-compression and exerting surrounding pressure on every system.*

*2. Self-compression results in the formation of spinning quanta of space; the spinning quanta are termed "formative dust". Due to the spin, every dust (and group of dust formed by surrounding pressure) is a source of repulsion.*

The first statement above describes the built-in mechanism of space to *transform* into the fundamental particles of which further structures are made. This built-in mechanism is postulated here as the self-compressive nature of space.

The second statement deals with the nature of the repulsive forces operating between any two systems.

### Concept of Inertia in Vethathirian Model

The essential feature of the Vethathirian Model is that it defines matter, energy and time as the manifestations of the space itself. The entire universe is of, by and in space.

Let us briefly discuss the interpretation of inertia by Galileo, Newton and Mach. Galileo interpreted inertia of matter as the resistance that a body would give to a force applied on it. Following Galileo, Newton obtained the inertia of a body as a constant of proportionality between a force applied on it and acceleration thus produced. Hence, Newton considered the mass of a body to be absolute. Mach challenged the absoluteness of inertia of the body and argued that inertia of the body is a measure of its interaction with ambient matter and hence depends on the configuration of matter surrounding the body.

Vethathirian Model modifies the Mach principle to become as follows:

*"The inertia of a body is due to the effect on it by the self-compressive nature of space, and also due to its interaction*

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*with surrounding matter".*

Let us consider first the effect of the compressive force on a given particle 'A', in the absence of any other surrounding matter.

If 'C' is the constant compressive force exerted on the unit are of particle 'A', and 'R' represents the repulsive force per unit area of the particle due to its spin, then

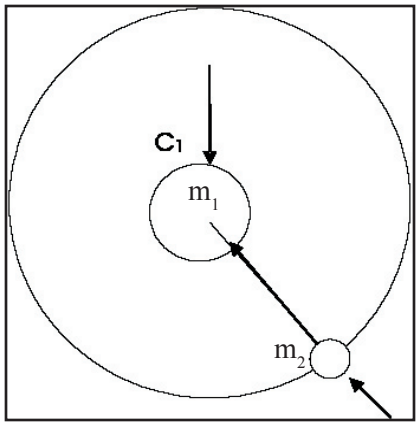
a (C - R) where 'a' is the surface area of the particle

represents the net gripping force acting on the particle. The greater the gripping , the greater would be the difficulty for an applied force to move the particle. This difficulty is interpreted classically as the inertia (mass) of the particle. If m is the mass of the particle,

$$m \propto a\,(C - R) \text{ or}$$

$$m = \beta\, a\,(C - R) \qquad (1)$$

**Derivation of Newton's law of Gravity**




The compressive pressure field at a distance r will be

$$C(r) = AC_1 / 4\Pi r^2 \qquad (2)$$

Where A is the surface area of the mass $m_1$.

Due to the presence of the object there is a compressive pressure field around it.

Let $R_1$ be the repulsive flux emanating from unit area of the object of mass $m_1$.

The repulsive pressure field at the distance r will be

$$R(r) = AR_1 / 4\Pi r^2 \qquad (3)$$

The total force on the mass $m_1$ gripping it will be $A (C_1 - R_1)$.

If $m_1$ is the mass of the object, $m_1 = \beta A (C_1 - R_1)$

If we keep a mass $m_2$ at a distance r from $m_1$, the force ($F_2$) on $m_2$ can be written as

$$F_2 \propto AC_1 / 4\Pi r^2$$

$$\propto - (AR_1 / 4\Pi r^2)$$

Hence, $F_2 = K_1 A (C_1 - R_1) / 4\Pi r^2 \qquad (4)$

$$F_2 = K_1 m_1 / \beta\, 4\Pi r^2$$

By a similar argument, if $F_1$ is the force on $m_1$ due to the presence of $m_2$ then,

$$F_1 = K_2 m_2 / \beta 4\Pi r^2 \qquad (5)$$

By Newton's action-reaction principle, $F_1 = F_2$ which implies

$$K_1 m_1 = K_2 m_2 \text{ or}$$

$$K_1 / K_2 = m_2 / m_1 \qquad (6)$$

This means, $K_1 = \mu m_2$ and $K_2 = \mu m_1$

Therefore $F_1 = F_2 = F = \mu m_2 m_1 / \beta\, 4\Pi r^2$

$F = G m_1 m_2 / r^2$ where the constant $G = \mu / \beta\, 4\Pi$ (7)

**DISCUSSION**

A derivation of a well-known formula by a fresh set of axioms has great significance. It demonstrates not only the relative validity of the past but also the enlarged validity of the present. It is gratifying to note that we are able to get back Newton's law of Gravity.

The significance of eqn.(4) of this paper is that it expresses the centripetal force F in terms of the contributing forces. This is in sharp contrast to the approach of Newton wherein he expressed the force F in terms of the masses and to the approach of Einstein wherein he wrote his field equations in terms of parameters of the curvature of space.

To begin from a basic unitary state and to identify that as the source of all physical phenomena essentially represents a unified approach. The Vethathirian Model begins from the radical Beginning – the single entity, space. Space itself transforms into the universe; by self-compression space becomes particles. The spin of a particle produces in space a radialy outward repulsive flux, which we call magnetic wave. By the interaction of the compressive and the repulsive forces innumerable systems are formed.

As Newton believed space to be nothing but a passive, empty background, he had no option but to attribute both the properties of inertia and gravity to the mass of the particle. He was forced to introduce two masses for the same particle - inertial mass and gravitational mass - the first one as a measure of its resistance to an applied force and the second as its strength to attract other particles. However, in our model (C – R) appears as inertial effect in eqn.(1), and the same appears in eqn.(4) as the gravitational effect of the same particle.

As (C–R) changes, there is a change in the inertial effect and there is also a corresponding equivalent change in the gravitational effect. This is our version of the "principle of equivalence", which Newton admired as a "God-given gift" and which Einstein exploited to formulate his General Theory of Relativity.

## CONCLUSION

Science progresses only through constant review and updating. The necessity to revise or update a given theory may arise from new experimental results or from the demands of aesthetic or philosophic logic. Instances of both of these are abundant in the history of science. Vethathirian Model is another instance of the latter case. Vethathirian Model begins from the radical beginning itself, and hence has a philosophic base. Contemporary science rather begins from the stage of fundamental particles without sufficient knowledge as to the essential nature of these particles. The fact that the Vethathirian Model begins with and consistently proceeds from the radical, primordial state - the space - is its strength and gives us a holistic perspective. Only a holistic theory can be profound enough to reveal the fundamental Truth and it is in this context that Vethathirian Model is significant and valuable. It is not a superficial modification of Newton's or Einstein's concepts, but a radically different theory which has finally brought monism into scientific thinking and thereby Effect is seen as inherent and inseparable from its Cause.

It all began with Tycho de Brahe, a great experimentalist of the sixteenth century. His lifelong rigorous observations of celestial objects produced an ocean of data. From these heaps of numbers Kepler carved out a set of empirical laws known as Kepler's laws of planetary motion. Using these laws Newton deduced his law of gravity in terms of masses. Then came Einstein: he was the first to attribute a role for space for understanding gravity. He considered space as the transmitting agency of gravitational interaction between two bodies. From Einstein, we now come to Vethathiri Maharishi who asserts that gravity is the inherent property of the space itself. The journey of mankind to understand the source of gravity reaches a decisive stage in the Vethathirian concept of space.

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