International Journal of Research in Engineering and Science (IJRES)
ISSN (Online): 2320-9364, ISSN (Print): 2320-9356
www.ijres.org Volume 9 Issue 8 ǁ 2021 ǁ PP. 43-45

Gravity Mass & Time

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A B S T R A C T
The aim of this paper is to determine relationship between force acting on a freely falling body and acceleration produced by the force . The paper defines acceleration as a force of attraction responsible for change in speed of body; the paper also uses cosmetic examples such as that of blackhole to defy law of conservation of mass or space-time singularity theory proposed by Subrahmanyan Chandrasekhar and further studied by Stephen Hawking.

Date of Submission: 12-08-2021 Date of acceptance: 27-08-2021

I. INTRODUCTION

This Research paper is based on basic concepts of gravity introduced to the people by Sir Isaac Newton.

In physics, theories of gravitation postulate mechanisms of interaction governing the movements of bodies with mass. There have been numerous theories of gravitation since ancient times. The first extant sources discussing such theories are found in ancient Greek philosophy. This work was furthered by ancient Indian and medieval Islamic physicists, before gaining great strides during the Renaissance and Scientific Revolution, culminating in the formulation of Newton's law of gravity. This was superseded by Albert Einstein's theory of relativity in the early 20th century.

Greek philosopher Aristotle (fl. 4th century BC) believed that objects tend toward a point due to their inner gravitas (heaviness). Vitruvius(fl. 1st century BC) understood that objects fall based on their specific gravity. In the 6th century CE, Byzantine Alexandrian scholar John Philoponus modified the Aristotelian concept of gravity with the theory of impetus. In the 7th century, Indian astronomer Brahmagupta spoke of gravity as an attractive force. In the 14th century, and influenced by certain Islamic scholars, European philosophers Jean Buridan and Albert of Saxony linked impetus to the acceleration and mass of objects. Albert also developed a law of proportion regarding the relationship between the speed of an object in free fall and the time elapsed.

In the early 17th century, Galileo Galilei found that all objects tend to accelerate equally in free fall. In 1632, he put forth the basic principle of relativity. The existence of the gravitational constant was explored by various researchers from the mid-17th century, helping Isaac Newton formulate his law of universal gravitation. Newton's classical mechanics were superseded in the early 20th century, when Einstein developed the special and general theory of relativity. The force carrier of gravity remains an outlier in the search for a theory of everything, which various models of quantum gravity are candidates for.

II. DISCUSSION

Under the theme of laws of gravity, Sir Isaac Newton proposed three laws of motion: -

1) $V = U + at$
2) $V^2 - U^2 = 2as$
3) $S = Ut + at^2/2$

Where, 'V' stands for final velocity, 'U' stands for initial velocity, 'a' stands for acceleration, 't' stands for time 'S' stands for distance.

By these set of equations we can evaluate, great amount of kinematics of an moving object.

We can calculate kinematics of an object falling from a top of a building, but we can not calculate kinematics of a body thrown from a building with a force, this is where my research jumps in :-

As we know that force, mass and acceleration are related to each other by the formula
F = Ma, where 'F' stands for Force, 'M' stands for mass, 'a' stands for acceleration.

$F = Ma$
$a = F/M$

So, from this formula we can calculate the acceleration that will be put on by a force of certain magnitude on a body of certain mass.

Example – If a body of mass 100 grams is thrown from a top of a building 100-meter high with a force of 50 Newton, calculate the acceleration imposed on the body.

Solution – Given
Mass = 100 kilograms
Height of Building = 100 meters
Force imposed = 50 Newton

TO FIND ACCELERATION BY FORCE
$a = F/M$
$a = 50/100 = 0.5 m/s^2$

Total Acceleration = Acceleration due to gravity + gravity imposed by force
Total Acceleration = $9.8 + 0.5 = 10.3\ m/s^2$

By the equation of a= F/M, we can conclude that,
velocity of a falling body = U + at
velocity of a falling body = U + [(F/M) + g] t
where 'g' stands for acceleration due to gravity.

III. FRICTION

We know that Friction is a force,
As discussed earlier by equation F= Ma,
We show that Friction is a force which produces negative acceleration in a body which is often categorized as retardation. Retardation is responsible for decrease in velocity of a moving body.

So, if we study motion of a accelerated moving ball, we observe that, acceleration acts to increase velocity of the ball whereas retardation caused due to frictional force will try to decrease the velocity of the same moving ball, So the effect of acceleration and frictional force will cancel out and its net sum will act on the body : if a body has acceleration higher than the retardation produced by frictional force it will increase the velocity of the moving ball, whereas if retardation produced by frictional force of a moving ball is more than acceleration then it will start decreasing the velocity of the ball.

So by this we conclude that frictional force acts on acceleration of the moving body and not directly on velocity of moving body.

IV. GRAVITY AND BLACK HOLES

When we talk about the gravity of a blackhole it is nothing but a attraction force applied by blackholes to bodies around it, every mass imposes a force on acceleration on the other like sun imposes force of gravity on other planets, even 2 people can impose a force of gravity to each other but the magnitude of this force is negligible.

Force of gravity is calculated by the formula:-

$F = G(m_1m_2)/R^2$

F = Force of Gravity
G = Gravitational Constant
m_1 = mass of 1st body
m_2 = mass of 2nd body
R = Distance between the bodies

Well Black Holes are known for their super gravitational force, greater than anything ever discovered by humans.
When we say that, gravity of blackholes is very high we mean that a body around blackhole is accelerated with a very high magnitude towards the blackhole, the velocity needed to escape the gravitational effect of blackhole is more than that of light this is the reason why light is unable to escape a blackhole.

If light itself cannot escape gravity of the, then this concludes that gravity of blackhole increases the velocity of the body under its influence even more than the velocity of light, and according to Stephen Hawking, a body moving with speed near or more than the speed of light does time-travel,
This might be the reason why a body is never found again once it enters a blackhole.

This might make us conclude that blackholes are sort of time-portals.

Now, according to Stephen Hawking time did not exist before BIG BANG, this means that there would be no acceleration and by the formula of F= Ma, we conclude that there was no mass.

But after BIG BANG we have several heavy mass objects called stars, planets, moons etc…

Well, this suggests that mass was created after BIG BANG, this opposes the LAW OF CONSERVATION OF MASS.

So, we reach to collision of two highly respected theories.

REFERENCES

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