A Physics Project On ,

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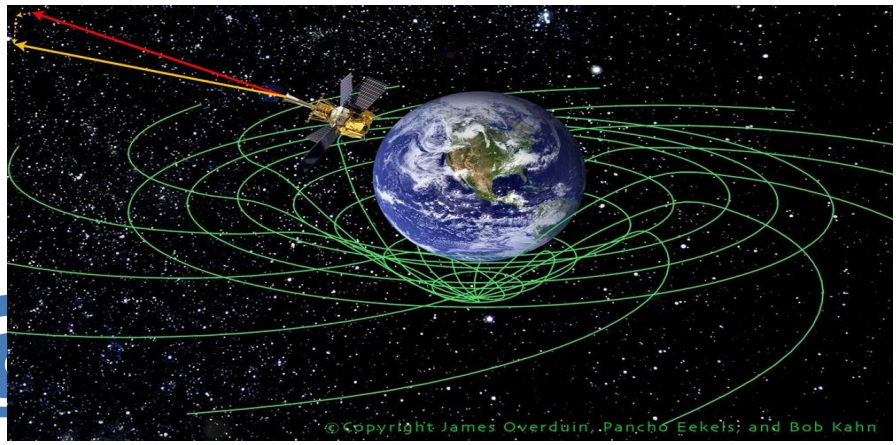

Submitted by :-

Name - (Your Name)

Class - XI '(Grade)'

Roll no. – (Your roll no)

submitted to:-

(Teacher's Name)

ACKNOWLEDGEMENT

I would like to express my sincere gratitude to our physics laboratory teacher (Teacher's Name) for this vital support, guidance and encouragement without which this project would not have come forth from my side. I wish to extend my heartiest thanks to my parents and my friends for their undivided support and interest which inspired me and encouraged me to go ahead.

(Your Signature)

CERTIFICATE

This is to certify that the entitle **Gravitation** project by (Your Name) of class XI is in accordance to the topic allotted to him. This project is submitted in partial fulfillment of the Summative Assessments. It embodies original work done by him under my supervision and guidance.

Signature of internal examiner

Signature of external examiner

Signature of supervisior

DECLARATION

I, (Your Name) a student of class XI of (School Name) do hereby solemnly declare that this project entitles "Gravitation" of physics practical is an original work done by me under the true guidance of our physics teacher (Teacher's Name).

Student's Signature

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ABSTRACT

Every body in the universe attracts every other body with a force called force of

GRAVITATION. Thus, gravitation is the force of attraction between any two bodies in the universe. The attraction between sun and earth and a table and chair lying in a room are some examples of gravitation.

Gravitation is weakest of the four basic forces.

Gravity is a special case of gravitation, about which we are going to discuss in details in this project.

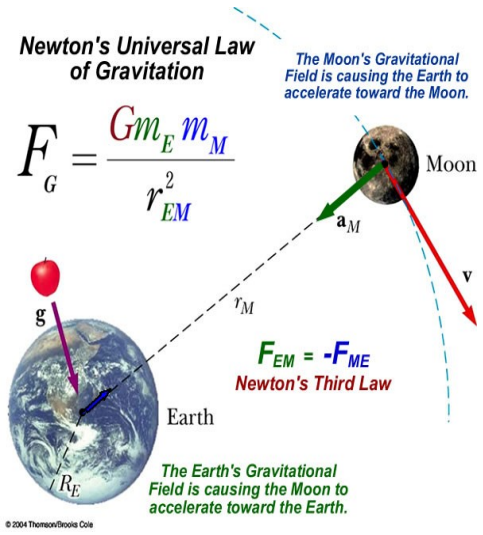
METHODOLOGY

For the accomplishment of this project investigation has been preferred. This project has been conducted by keen observation on the objects that act under the Law Of Gravitation. All objects or particles undergo gravitation and this is an example of how ideas in science develop into laws and theories to know about the motion of heavenly bodies.

DATA CONTENTS

In this project we are going to focus on;

- *Kepler's Three Laws of Planetary Motion.*
- *Applications of Kepler's Law.*
- *Newton's Universal Law Of Gravitation.*
- *What is Freefall ?*
- *What is acceleration due to gravity ?*
- *Difference between Kepler's Law and Newton's Law.*
- *Theories about planetary motion.*
- *What is weightlessness ?*



DATA ANALYSIS

1.Kepler's Three Laws Of Planetary Motion :-

- The law of Orbital –

  All planets move in elliptical orbits around the sun with the sun at one focus.

- The laws of Area –

  The line Joining centre of a planet and the sun sweeps equal areas in equal interval of time, that is the areal velocity of the planet around the sun is constant.

- The laws of Period or Harmonic law –

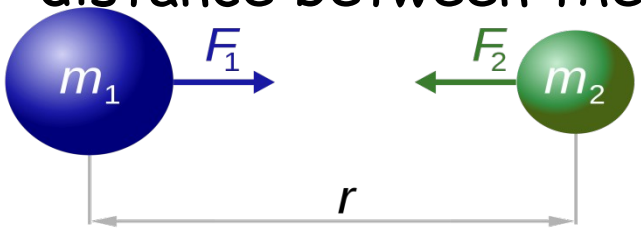
  The square of time period of revolution of a planet around the sun is proportional to the cube of the semi major axis of its elliptical orbit.

2.Applications of kepler's law -

- Solar System
- Artificial Satellite
- Moon's revolution around the planet
- Whenever inverse square law is involved

3. Newton's universal law of gravitation -

Every particle in the universe attracts other particle with a force which is directly proportional to the product of their masses and inversely proportional to the square of the distance between them.



$$F_1 = F_2 = G\frac{m_1 \times m_2}{r^2}$$

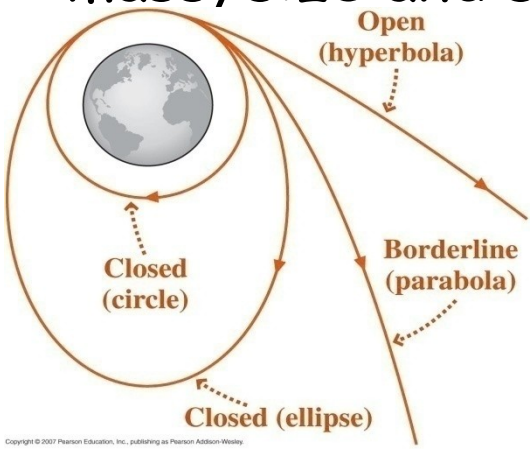
Here, F1 and F2 are magnitude of gravitational force and m1 and m2 are masses of two paricles, r is the distance between both the particles and G is universal gravitational constant.

4.What is free fall ?

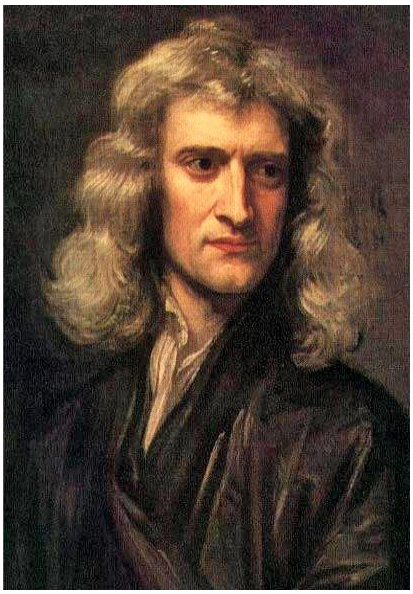
The motion of a body under the influence of gravity alone is called freefall. If we neglect the resistance or friction offered by air, the fall of a body in air is a free fall.

5.What is acceleration due to gravity ?

When a body falls freely toward the surface of earth, its velocity continuously increases. The acceleration developed in its motion is called acceleration due to gravity which is produced when the object is freely falling under the gravitational pull of the earth is called acceleration due to gravity. It is denoted by 'g'. And is a vector quantity directed toward the earth independent of mass, size and shape of the body.



6. Difference between kepler's and newton's law :-



Serial no.	Newton's law	Kepler's law
1.	About motion and force.	Motion of planetary system.
2.	It is kinematics.	It is dynamics.
3.	Involve interaction between objects.	Do not involve Interaction.
4.	Relation among force, mass, distance and time.	Relation among distance and time only

6. Theories about planetary motion :-

Since ancient time, scientists have been studying the motion of celestial objects like sun, moon, planets, etc.

Some of these note-worthy theories are as follows –

6.1 Geocentric model: According to this model, "the earth remained stationary at the centre and all planets, moon, sun and other stars revolve around the sun".

6.2 Heliocentric model: In 1543, Nicolaus Copernicus suggested that "the sun is at the centre of the solar system and the earth and other planets revolve around it".

6.3 Aryabhatta's contribution: Aryabhatta proposed that "the earth revolve round the sun along with other planets and also rotates around its own axis".

7. What is weightlssness ?

When a body presses against a supporting surfae, the supportin surface exerts opposite force on the body. This force of reaction creates a feeling of weight and if somehow this reaction force becomes zero,

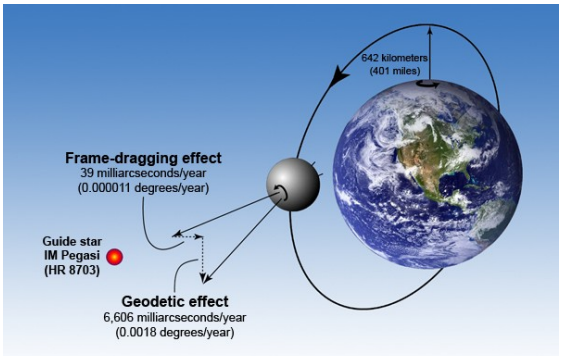
CONCLUSION

Newton's law as well as Kepler's law has helped us a lot in the field of gravitation and also in the field of physics. His concept was also used in technology of rocket propulsion, hence he is considered one of the greatest physics.

From Kepler's 3rd law we can deduce the law of gravitation.

Gravitation give us idea about the theories of planetary motion like;

Geocentric model, Heliocentric



	Measured	Predicted
Geodetic precession (mas)	6602 ± 18	6606
Frame-dragging (mas)	37.2 ± 7.2	39.2

BIBLIOGRAPHY

- www.quora.com
- https://en.wikipedia.org
- www.physics4kids.com
- www.study.com
- www.examfear.com
- Physics NCERT book, XI
- Concepts of physics (H.C. VERMA)