

Gravity Cannon Experiment Test of General Relativity

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Abstract

The gravity cannon experiment is a very simple mechanical measurement that can provide decisive confirmation or falsification of the various gravity theories. In particular, a short video of its actual gravitational dynamics would provide the ultimate and dramatic test of Einstein's equivalence principle of force and motion. The unambiguous result would be easily understood by everyone from cosmology theorists to the smallest child who can run and jump.

Space Aliens and Gravity

To fully understand the principle of the gravitational expansion of mass, space, and time, it is necessary to first present a little science fiction tale. This is a story about the initial discovery of gravitational force and momentum by a group of scientists far more advanced than beginners like Galileo, Newton and Einstein.

As our story begins, a group of space alien people are traveling through the cosmos in the star ship Titanic. They are light years away from their home planet when they finally reach our solar system and discover planet Earth. They have been on the journey for many generations and for one reason or another have lost all knowledge from their former civilization. They are technically advanced and have a wide array of sophisticated observing and measuring devices. Being far removed from any large bodies of matter for thousands of years, there is no reason for any of them to consider the unfelt and unmeasured gravitational fields. They have always had the "artificial" gravity caused by the titanic spinning like a rifle bullet. The living quarters are located around the outside of the ship's hull where they have normal Earth "gravitational" acceleration. The astronauts feel the floor pushing them toward the ship's center with centripetal force. When they move to the center they are weightless. They completely understand the mechanics of the centrifugal and centripetal forces that produce the upward push of gravity they feel in the living quarters.

The artificial gravity saves their bodies from the damaging effects of being weightless for long periods of time. The space travelers understand this constant centripetal acceleration very well and are able to increase or decrease it by changing the rate of rotation with centrifugal force. They are also familiar with the momentary linear acceleration and deceleration produced by the ship's engines. It is just that they do not associate measurements of accelerations and decelerations with the occult activity of gravitational attraction. They never considered the existence of gravitation because they never had the opportunity to observe it.

At long last, the Titanic approaches a star surrounded by a group of planets. After decelerating their spacecraft to the inertial frame of the star, the space aliens decide to stop and explore one of the inner planets that has oceans and continents. They were looking for a new planet to call home and this looked to be a likely candidate.

As they maneuvered their spaceship around the planet, they unexpectedly noticed that its surface seemed to rush towards them when they were not measuring any acceleration toward it. After a number of speed adjustments and calculations they determined that they could set their ship at a velocity vector that was both away from the planet and at right angles to it and that exactly balanced the motion of the planet's surface toward them. These maneuvers put them in a circular orbit around the planet. Eventually, they guided the ship to a stationary point above the rotating planet's equator (geosynchronous orbit).

They didn't quite understand the actual dynamics of this orbit, but since the Titanic seemed to be secure as it revolved with the planet, they decided to send a smaller exploratory craft down to the planet's surface where they could observe this strange new world from close up.

As they moved down toward the planet's surface, they had to keep accelerating the craft upward in order to eventually make a soft landing. Once they arrived on the surface, they were able to measure that it was accelerating upward at 10 m/s^2 just like the floor of their spinning spaceship. Once the explorers got out of the craft and started walking around, they found the upward acceleration of the ground felt exactly like the inward centripetal force of their rotating quarters back on the Titanic.

After thinking about this strange phenomenon for some time, they concluded that the matter within the planet must be slowly expanding. This idea would also explain how the Titanic was able to maintain its orbit around the planet. It was simply moving away from the planet at the same speed that the planet's surface was moving toward it. While the idea of an expanding planet seemed rather strange and unexpected, it was certainly what they had measured with their accelerometers and almost no one was going to claim that the accelerometers were wrong. No one was able to come up with an alternative explanation.

Then an old man with fuzzy white hair suggested the somewhat incomprehensible theory that there was some kind of a virtual attraction between the people and the planet that constantly pulled them together. This idea seemed completely out of the question to the majority of the observers because such an unmeasured effect would be completely unlike the effects of magnetic and electrical attractions that they were all accustomed to calculating and measuring. The concept of an unbounded gravitational attraction between individual atoms also seemed to be completely unreasonable because the simpler and more intuitive local measurement of expanding gravitational momentum was so readily at hand.

These were practical people who were used to the everyday measuring of force and acceleration in a straightforward way. The idea of an infinite and inal-

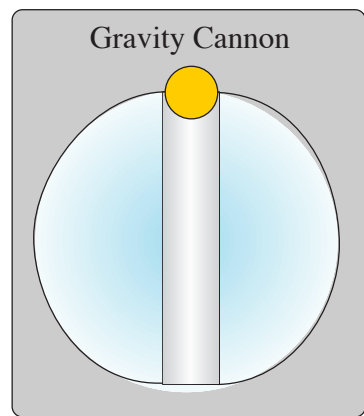
terable attraction between all bodies of matter and photons seemed preposterous and such an unlikely and counter-intuitive concept could simply not be accepted by most of them.

They concluded that if the matter within the planet was slowly expanding, then the matter contained within the Titanic and even their physical bodies were also expanding at an, imperceptible rate. To test their new principle of gravitational expansion they placed sensitive accelerometers at both the Titanic's bow and stern. They discovered that the two ends of the Titanic were accelerating and moving away from each other at a small but measurable velocity. The old man with the white hair claimed their experiment proved nothing since his mass attraction theory would produce identical results.

The technicians got together and designed an experiment in which gravitational expansion and gravitational attraction would yield different results. They fashioned a large glass sphere with a hollow shaft through its center. They then machined a solid Gold ball that would loosely fit within the shaft. A number of accelerometers were attached to the sphere's surface and another one was put at the center of Gold ball. They then placed the ball at rest in the hole at the outer surface of the sphere and then recorded video of the apparatus as the ball began to move down the shaft towards the center of the glass sphere.

The Gravity Cannon Test

*The gravity cannon is a definitive experimental test that can easily differentiate between the four possible general theories of gravity. This test is so simple and basic that once it has been performed, the results can be put on **You Tube** to make it possible for the true nature of gravity to be understood by everyone. Even the small child will be able to clearly see and understand just how gravity really works.*



The old man predicted the ball would be attracted toward the center of mass and accelerate to a maximum velocity at the center and then decelerate to a stop at the opposite end of the hole. He claimed this back and forth motion would repeat endlessly barring any friction between the ball and the sphere. The rest of the group predicted gravitational expansion would leave the ball motionless while the surface of the sphere moved away from it in all directions.

As they watched, the ball appeared to decelerate to stop at the center. When they checked the accelerometers they found that all points on the sphere's surface continued to accelerate away from its center while the ball registered no acceleration at all. They concluded that gravitation attraction could not exist because, like Einstein, they were unable to devise any experiment that could detect it.

In conclusion, no rational space alien who carefully measured gravity would ever conclude that it is some kind of occult and non-local attraction between atoms when it can be easily measured that the mass, space, and time of all atoms are slowly expanding at a constant rate that is synchronous throughout the Living Cosmos.

The Gravity Cannon Test for the Law of Gravity

The gravity cannon is a very simple mechanical device for measuring the direction of gravitational force. It can be used in the confirmation or falsification of the various gravity theories. In particular, a short video of its actual gravitational motion would provide an ultimate and dramatic test of Einstein's equivalence principle for force and momentum. The unambiguous result would be easily understood by everyone from cosmology theorists to the smallest child who can run and jump.

The gravity cannon is a very simple mechanical device with only two “moving” parts. It is simply a glass sphere with a barrel running through its center and a gold cannonball moving in the barrel. The measurement is made by a video camera recording the motion of the ball relative to the barrel. The result of the experiment will absolutely determine what actually moves. Is it the cannon or the cannonball?

Although it would have to be performed in the weightlessness of an Earth orbit, this experiment could otherwise be executed very easily and inexpensively. It would be able to decisively differentiate between the four possible theories of gravitational force and motion that exist among gravitational theorists. The experiment would also provide the means to verify and calibrate earthbound measurements and calculations of both the Newtonian force constant G and the gravitational velocity constant G_v .

Four Gravity Theories

There are four basic gravity theories. These include the two pulling medium theories of an homogeneous aether and an infinite particle aether. The other two are the internal and external pushing particle theories.

These four ideas each use different complementary equations to explain the many measurements that have been made of gravitational force and motion. Depending on their various assumptions, the calculations made by all these theories can be made to account for most gravity measurements but not the Gravity Cannon measurements.

The Gravity Cannon Experiment is an actual miniature version of the Hole-Through-Earth thought experiment that has been proposed by Galileo many

other gravitational theorists. The beauty of this measurement is that it would produce a different value for each of the four gravitational theories.

Currently, experimental physicists measure gravitational force with accelerometers and gravitational momentum with atomic clocks. These measurements were combined in the Pound-Rebka experiment to determine that Einstein's equivalence principle was completely compatible with the measured values but completely unnecessary to explain the actual dynamics of gravity. The Gravity Cannon combines the force and motion of gravity into a single measurement that represents either force or motion. The results will determine whether the test measures gravitational force causing motion or if instead it actually measures gravitational momentum causing force.

Two Pulling Gravity Aether Theories

Aethers and fields are defined as any description or condition of space that is not an eternal dimensionless void. Fields are local conditions of aether or spacetime that extend between and connect atoms. They can either be local between atoms or they can extend to infinity as gravity.

The homogeneous aether theories explain gravity as a single, universal, solid or liquid all pervasive aether continuum. Curvatures, ripples, and waves within this universal substance cause bodies of matter to move toward one another. In the infinite particle aether theories, gravity is explained by a potentially infinite number of gravitational particles, waves, or fields that are usually called gravitons. These calculated wave-particle dualities are generated at the center of each body of mass and then spread out in all directions to infinity at the speed of light.

General Relativity is a homogeneous aether theory that has been mathematically crafted into several interpretations. Its equations usually calculate a four-dimensional spacetime continuum that connects all matter and interacts with an apparent but otherwise undetectable force that causes gravitational force and motion. The presence of a body of mass causes the continuum to curve and produce motion in the body.

General Relativity is sometimes classed as an infinite particle aether theory because in some versions the force of gravity is spread from atom to atom across the universe by great numbers of tiny wave-particle dualities called gravitons. These wavelike particles move through the continuum at the speed of light and are calculated to cause portions of the spacetime to curve in such a way as to cause the appearance of gravitational motion between bodies of matter.

Two Pushing Particle Gravity Theories

*Pushing particle theories are divided into the external downward pushing aether particle theories and the internal upward push of the gravitational expansion of mass, space, and time with the pushing particles being electrons and protons. The external pushing gravity theories explain gravity by assuming that large bodies of matter like Earth are constantly being pushed inward toward their centers by great numbers of tiny undetectable particles impinging on them from all directions of space. **The internal pushing particle principle explains gravity as the measured outward force caused by expanding protons and electrons pushing on one another from within Earth's interior.***

External pushing gravity theorists claim the observed downward motion of falling bodies is produced by the absorption of tiny undetectable extremely high speed particles that are assumed to exist uniformly distributed throughout all of space. Some of these theories predict particle speeds many orders of magnitude greater than the speed of light. When these particles strike matter, they give it a slight push. These omnidirectional particles push the surfaces of large bodies towards their centers. Such theories predict that the Gold ball would be pushed back and forth from one side of the glass sphere to the other similar to the predictions of pulling gravity aether theories.

An external pushing gravity theory was first proposed by Nicolas Fatio in 1690. Later, similar theories were proposed by Le Sage and others. Rene Descartes had a pushing gravity theory in which numerous tiny whirlpools within the aether pushed on matter.

While external pushing gravity theories have never gained much credibility among the physics establishment, they have a wide following among alternative gravitational theorists. These theories have no explanation for the equivalence principle and generally ignore the concept altogether.

In the internal pushing particle principle of gravitational expansion, the particles that do the pushing are the well established protons and electrons within atoms. This explanation of gravity is a principle of measurement and not a theory because the outward force and momentum of gravity is easily measured with accelerometers and clocks and there is no reason to assume that there anything more to gravity than what we measure. The motion of the gravity cannonball can easily indicate the truth between the internal and external pushing and pulling particle explanations of gravity.

In the internal pushing particle principle of gravitational expansion of atoms, the Gold ball would move from the surface of the sphere to its center where it would gradually slow to a stop. All of the pushing forces are contained at the surface of the glass sphere and there is zero force exerted between the cannon

and cannonball. The centers of both the cannon and cannonball remain at inertial rest. All that really moves is the outer surface of each body.

Three Possible Gravity Measurements

The force of gravity can only be measured as a downward pull, a downward push or an upward push. Almost all theoretical physicists imagine it to be a downward pull and a few believe it to be a downward push but only experimental physicists know it to be a measured upward push.

There can be only three possible outcomes to the gravity cannon experiment. This test will decide the absolute physical truth between whether gravity points down with equivalent force motion as Einstein imagined and calculated or whether the force of gravity points up as he always felt and measured.

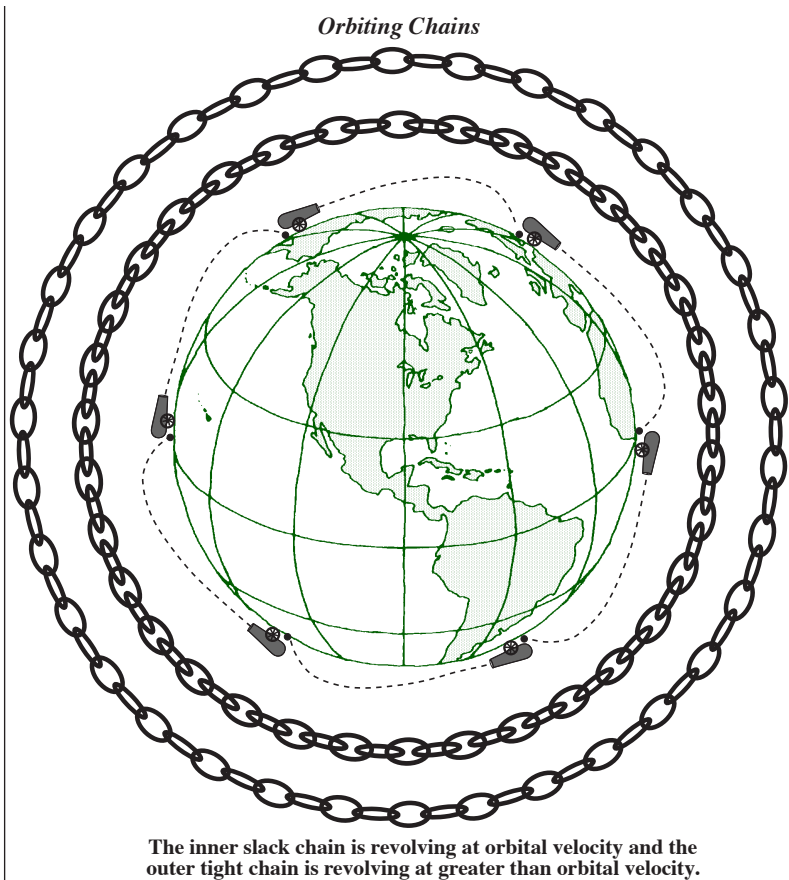
The **first possibility** is that the Gold ball will accelerate down at a decreasing rate and then decelerate to a stop at the center of the cannon. This outcome would match all other measurements of gravitational force and motion made at Earth's surface. This result would not require a "theory" for a gravitational mechanism because the physical measurements are the mechanism. Gravity is nothing more than our measurements of the gravitational expansion of mass, space, and time.

The **second possibility** would be that the Gold ball will accelerate down at a decreasing rate until it reaches the center at maximum velocity and then decelerates to a stop at the other end of the barrel. This process then repeats itself as perpetual changing motion as the ball moves back and forth from one end of the barrel to the other. This result would require energy to be continuously transferred back and forth between cannon and ball as the gravitational momentum of the ball constantly changed. This result is predicted by Newton's and Einstein's theories of downward pulling fields. They use equations and calculations to explain the mechanism for the continuous unmeasured transfer of energy to and from the ball.

A **third possibility** is predicted by pushing particle aether theorists. This result would be similar to the pulling field theories but would be different due to the completely different proposed gravitational mechanism. In this proposal, there is no energy transfer between the ball and the cannon. The ball's changing energy is produced by unseen impinging particles from the cosmos. Momentum is conserved between the particles and the ball and not between the cannon and ball.

Conclusion

If the ball moves back and forth like all theoretical theorists have predicted, then the pulling field, curving space, and aether particle theorists will have to fight it out to see who is right based on subtle differences between predicted and measured values. However, if the ball moves to the center and stops, then no mechanistic theory is need to explain the transfer of energy since no energy is transferred. The theoretical physicists will all be wrong and only the experimental physicists will be correct. The ball does not actually move and remains at rest while the outer surfaces of both ball and cannon move away from their inertial centers. There is no absolute momentum between the inertial centers of ball and cannon.



The Orbiting Chain Thought Experiment

To demonstrate the actual dynamics an orbit around Earth, we will first describe an experiment that was available even in Galileo's time. A powerful cannon is fired over the surface of the Earth and the path of the cannonball is recorded.

The cannon is then fired again from the point where the cannonball struck. This process continues until the cannonball has traveled all the way around Earth. In each shot, the cannonball traveled in a straight inertial line until it was struck by the upwardly moving Earth. However, any photos of the cannonball's path would show it to have followed an apparent parabolic curve. In this digital orbit of the Earth, the cannonball always travels in a straight inertial line but at the same time its path always seems to curve downward. This apparent non-inertial curvature of the Earth's internal space results from the expanding dimensions of mass, space, and time.

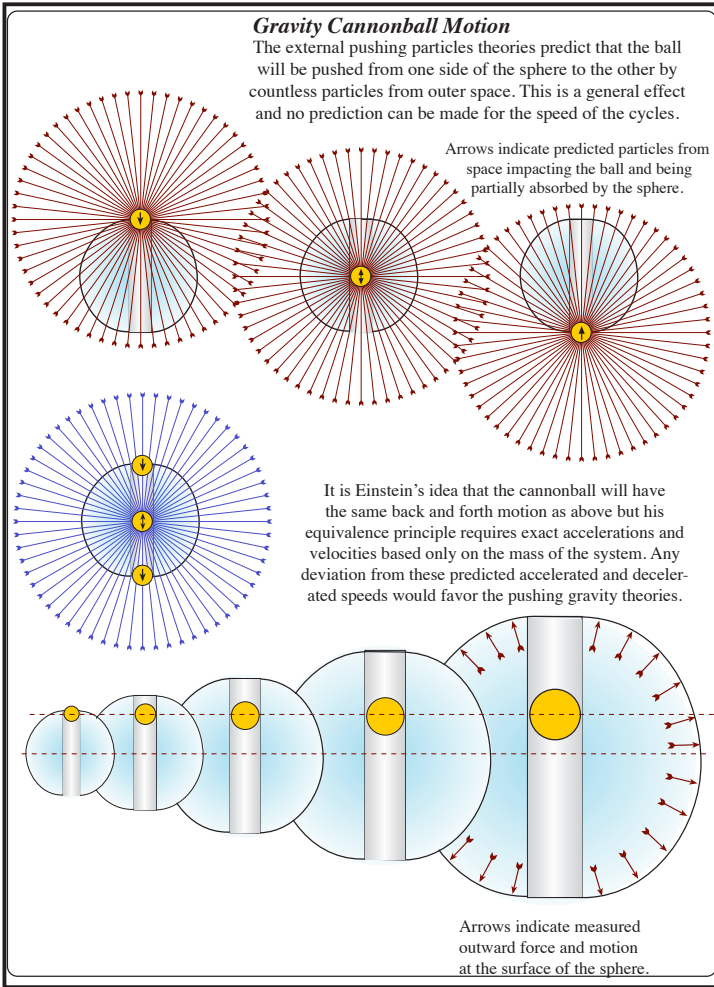
The orbiting chain is another possible model for creating an orbit around the expanding Earth. The chain is wrapped around the Earth and then spun at a high velocity. As the chain goes faster and faster, it tightens up and goes into an Earth orbit defined by its length. The faster the chain is spun beyond its orbital velocity, the tighter it becomes due to its increasing centripetal force.

To better understand how orbits work around gravitationally expanding bodies of matter, we can cause the chain to slow until its centripetal acceleration becomes less than the acceleration of gravity. The individual links slacken and lose their tension with one another. However, the slack chain as a whole still maintains its overall orbit while each loosely connected link maintains its own individual orbit without physically touching other links. The dynamics of this orbiting chain satellite are the same whether we use the mechanics of gravitational expansion or the gravitational field theory of Newton or the curved spacetime of Einstein.

Gravitational Expansion of Mass, Space, and Time

Absolute gravitational momentum and force is not a theory of gravity. It is just the measurement of gravity that reveals why we have always felt the upward push of Earth's surface. Chicken Little, Newton, and Einstein were all wrong. The sky is not falling down. Earth is falling up!

The principle of gravitational expansion reveals gravity totally in terms of its physical measurements with no metaphysical assumptions such as aethers, fields, actions at a distance, or unseen impinging particles from space. Expanding mass, space, and time show that our measurements of gravitational force are real and that the acceleration of gravity produces true upward motion. Gravity is merely the outward force produced by the gradual and constant dimensional expansion of mass, space, and time. A falling body does not accelerate downward because no such change in motion can be measured. Like the Gold ball in the gravity cannon, falling bodies do not change their state of motion while the surface of Earth moves upward with measured acceleration and velocity. Gravity and inertia are not just equivalent. They are exactly equal because they are the same thing.



Gravity Cannon Experiment

If gravity is not the infinite pulling and curving of spacetime throughout the universe then maybe gravity's quantum nature is just the purely local mechanical event of one atom pushing against another.

The principle of the gravitational expansion of mass, space, and time measures outward acceleration at the surface of the glass sphere, but no acceleration of the ball toward the centers of mass can be measured. Without physical acceleration, the ball will appear to move toward the center of the sphere with decreasing deceleration but will not have the inertial motion necessary to move past the mass center.

Einstein's idea of equivalent gravity predicts the opposite outcome for the Gravity Cannon experiment. Newton, Einstein, and all other gravitational pulling theorists make the complex prediction that the cannonball will accelerate toward the center of the sphere at a decreasing rate. It will reach maximum velocity at center and then is predicted to decelerate to a stop at the end of the barrel. This starts a new cycle where the ball accelerates back to the center and then decelerates to the other end of the barrel.

Successful Performance of the Gravity Cannon Experiment Could Save Billions of Dollars for World Governments and unit the people with a new principle of physics that they can all understand.

The gravity cannon test will provide decisive experimental and mathematical calculations of gravity. The experimental results will provide definitive proof for either the theory of General Relativity or the gravitational expansion of Mass, Space, and Time.

Other previous precise experimental measurements of gravity such as GPS clock rates and the Pound-Rebka shifts all yield the same predicted results for both gravitational expansion and general relativity. The beauty of the Gravity Cannon Experiment is that a different result is predicted by the different theories of gravitational force and motion.

The **Gravity Cannon Experiment** could be a worldwide media event. Everyone would be able to watch it live on TV or their cellphones. It would be a dramatic event that could unit the people of the world with the common knowledge of how their planet actually works. Everyone would remember where they were when they first learned that *Earth falls up!* No world religion would be opposed to the event because everyone would be watching the hand of their god revealing truth on a miniature world in space and then feel the same hand of God lifting them up here on Earth. It would change all people's minds and increase knowledge and understanding of their reality without causing any conflicts in their scared beliefs.

Even small children would be able to understand exactly how gravity works. They have been feeling and interacting with gravity their whole lives but now for the first time, they will realize the upward push from the floor that they always felt is real. They could only feel the "pull" of gravity when they climb a rope. It could easily create a renewed interest in science among the world's youth. They would all see an important scientific experiment being performed and realize they could understand scientific principles, such as gravity, at their deepest level without any complex equations. They would be eager to learn more about the experimental principles of physics and cosmology.

Once and for all, we will be able to know with certainty whether gravity points up or down and whether it is an upward push or a downward pull. Both General Relativity and gravitational expansion explain gravity as a curvature in the geometry of space and time. In general relativity, it is the cosmic space and time surrounding a body of mass that appears to curve and in gravitational expansion it is the local space and time within each body of mass that is actually measured to curve.

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