

Time

The Equivalence of Inertial and Gravitational Masses

Tony Collins

phoenixsequence.inc@gmail.com

Abstract

Inertia, the force you feel pulling on you as you accelerate and gravity - the force that attracts all objects with mass. Are two separate and distinct phenomena and yet they share an equivalence which has yet to be explained. In this paper, we will show how and why inertial and gravitational masses are equivalent and how time is the underlining mechanism which links and governs them.

Background and Introduction

For almost four hundred years, from Galileo Galilei to Isaac Newton to Albert Einstein, the scientific community has tried to unlock the enigma of gravity. In 1915, Einstein published his Theory of General Relativity, which describes gravity as a warping in the fabric of space-time. In the paper, "Time – The Equivalence of Inertial and Gravitational Masses" a new methodology is described explaining the process of exactly what causes inertia and gravity and proves that gravity is not caused by the warping of space-time. In doing so, will perhaps lead to a resolution where gravity and quantum mechanics can finally be reconciled. To achieve this, we took a step back and reanalyzed the nature of time which led to an undeniable conclusion about the nature of inertia and gravity.

What is inertia? Relative to an outside observer, as you accelerate, you acquire mass as your gravitational field and the amount of time dilation increase proportionally to your rate of acceleration. This increase in time dilation, subsequently moves you into the future, relative to any outside stationary clocks. Thereby, causing these stationary clocks, in the past, to see you as a path of least resistance into the future. Thus, these stationary clocks are drawn and pull on you in the opposite direction of acceleration. This is inertia, an accelerating mass creating a rising gradient of time dilation. Thereby, attracting outside stationary clocks, in the past, as its clock moves into the future.

What is gravity? In the earth-moon system, each body experiences a different amount of time dilation due to the different magnitude of its gravitational field. As such, each body exists at a different location in time relative to the other body. Therefore, earth's stronger time dilation means it exists at a position in time that is further in the future, relative to that of the moon's position. The moon, in the past, wants to reach a higher state of entropy and is drawn to the future here at earth's surface. Thus, gravity is the attraction between objects at different locations in time relative to one another due to time dilation, drawn together to satisfy the 2nd law of thermal dynamics.

Therefore, time is the mechanism and the reason why inertial and gravitational masses are equivalent. It is the attraction of bodies, that are in different relative locations in time, that want to reach a higher state of entropy.

To be stated accurately the moon is not just drawn to the earth. The earth is also attracted to the moon and the point in space and time where they would intersect is the temporal nexus of the system. This nexus is a point that all bodies are attracted to in a gravitational system, and its location is always closest to the object with the greatest mass.

Figure 1. Black holes with high magnitudes of time dilation are depicted in space. Blue regions represent the future and red regions represent the past. As with any massive object, clocks point in the direction of black holes as they are extreme regions of time dilation and future time.

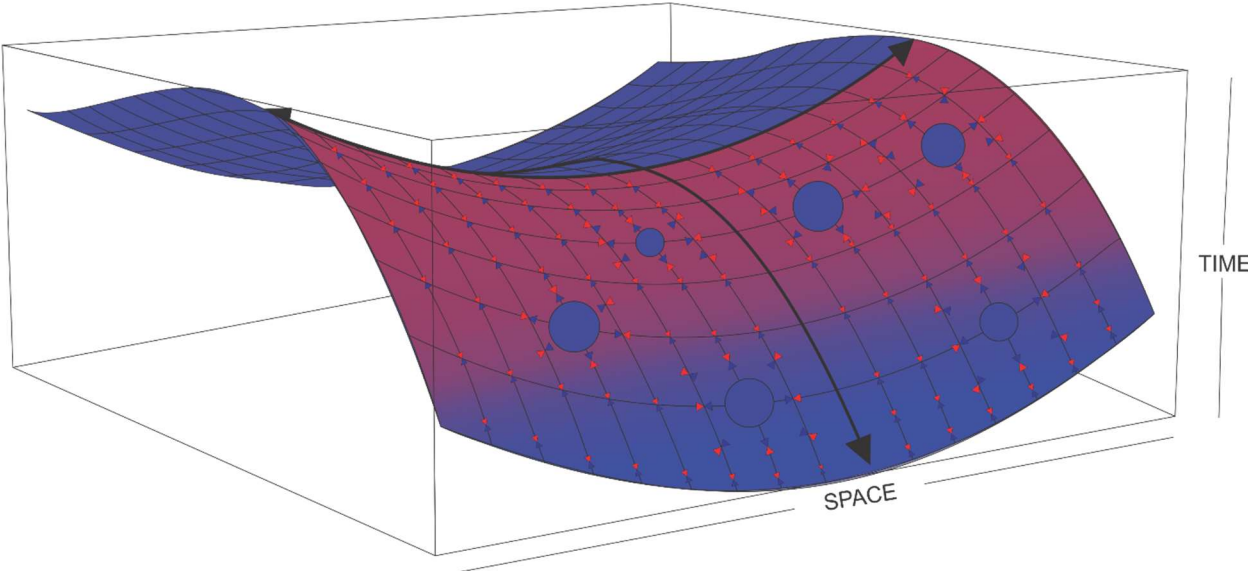


Figure 1. Clocks are attracted to the high magnitude of time dilation of black holes which reside in the future.

To measure the separation in time between two objects, we need to find the absolute position in time of each object. Therefore, the greater the separation in time between the objects, the greater the attraction between the objects divided by the spatial distance squared between them.

To find this absolute value, we need a common lighthouse in space and time that is the same in all reference frames. For this, we use the Big Bang, as every object is an absolute distance away in time from it, depending on the amount of time dilation of that object. As such, by measuring the magnitude of time dilation of an object, we can determine the object's distance relative to the Big Bang and hence, its absolute position in time.

Therefore, to calculate the absolute position in time for an object, we use the following constant. The greater the acceleration or subsequent gravitational field of an object. The greater the object's time dilation and its absolute position in time. As such, by measuring the acceleration of an object or the acceleration needed to escape the gravitational field of an object in question, as a function of the speed of light. We can determine the amount of an object's time dilation, also as a function of the speed of light. This, in turn, corresponds to an object's absolute position in time relative to that of the Big Bang and we denote this constant R_0 (r-naught). Figure 2.

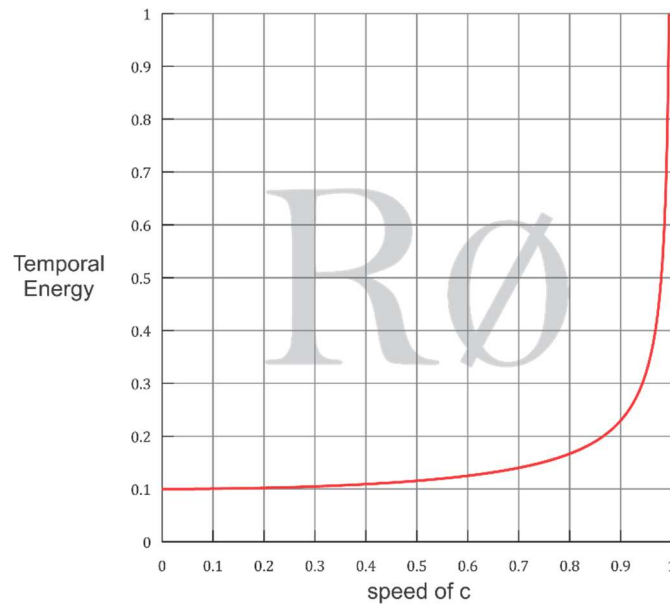


Figure 2. R0 (r-naught)

$$R0 = 1 - \sqrt{1 - \frac{v^2}{c^2}}$$

Where

v = velocity from 0.0 -1.0 of c

c = 1 the speed of light

R0 = amount of time dilation measured as 0.0 – 1.0 (1.0 = time dilation of a black hole)

The closer an object's R0 is to 1, the higher its subsequent time dilation. Since mass and time are intrinsically woven together. We write the equation for mass incorporating time in the following term. This equation explains how mass increases proportionally to R0, which is proportional to acceleration and given $E=mc^2$, this equation also explains how time (R0) is energy contained within mass.

$$m = \frac{(\sqrt{2R0-R0^2} \cdot c)^2 r}{2G}$$

Where

R0 = amount of time dilation measured as 0.0 – 1.0 (1.0 = time dilation of a black hole)

c = 299792458 speed of light in meters

r = radius of object in meters

G = gravitational constant

m = amount of mass in kg

Thus, we have conclusively shown how and why inertia and gravitational masses are equivalent, what gravity is and that time is the underlining mechanism responsible for each phenomena.

The following are conclusions of this theory.

1. Inertia and gravity is the attraction of time between two objects. All clocks in “the past” are drawn to “the future”.
2. Time itself has/is energy – temporal energy. It is intrinsically apart of mass and is what gives mass energy as it is accelerated or accumulated in a volume of space.
3. If antimatter does have reverse time symmetry and travels backward in time. Then “neutral” antimatter should fall up in a gravitational field as it races away from the future into the past.
4. Gravitational lensing and tidal force are caused by clocks being drawn to a common future. Not by the curvature of space-time.
5. Anything with the same amount of absolute time dilation has the same clock and exists at the same “now” no matter where they each are in the universe.
6. Space and time are not woven into a single 1 to 1 fabric of space-time. An object can be at a given distance away spatially but exist at a different location temporally. For example, if the sun was converted into a black hole. Spatially it would be 149 billion meters away. However temporally the black hole would exist in the far – far future. Thus space and time are not woven into a single fabric. Time has a separate coordinate system from that of space. It is actually mass and time that are woven together.
7. Gravitational acceleration of an object is the rate at which the object falls through time which is proportional to R_0 . On earth, that rate is 9.807 m/s^2

Acknowledgments

The author gratefully wishes to acknowledge the support of the entire scientific community, both past and present. As no scientific advancement can be achieved without the enormous sacrifices of giants that came before, and the accomplishments each has made in the pages of time – thank you.

Sample Equations

To find the R0 of earth we convert its escape velocity to a percentage of c.

Which gives us $11186 / 299792458 = .0000373125$ % of c, we then input this value in our equation for R0.

$$.0000000007 = 1 - \sqrt{1 - \frac{.0000373125^2}{1^2}}$$

Given earth's R0 we can calculate its mass in kg

$$6.006 * 10^{24} = \frac{(\sqrt{2^{.0000000007 - .0000000007} \cdot c})^2 6.371 * 10^6}{2G}$$

To find the R0 of a neutron star we again convert its escape velocity to a percentage of c.

Which gives us $125000000 / 299792458 = .416955119$ % of c, we then input this value in our equation for R0.

$$0.0910729244 = 1 - \sqrt{1 - \frac{.416955119^2}{1^2}}$$

Given the neutron star's R0 and a radius of 10 km we can calculate its mass in kg

$$1.170 * 10^{30} = \frac{(\sqrt{2^{.0910729244 - .0910729244} \cdot c})^2 10000}{2G}$$