

The Case for Absolute Time

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(Researched @: Butler Univ. Sci. Lib. Indianapolis, IN; Carmel Clay Public Lib. Carmel IN; et al)

Modern science recognizes three major theories as useful in describing our physical reality. Each useful within definable limits, but each also containing unrealistic elements that indicate their current descriptions are either incomplete or that reality itself may well not be realistic in terms of a common sense reality based on Euclidean Space and Absolute Time. Classical Theory using Newtonian Mechanics although still useful in general application is not expected to produce a complete solution for physics, one reason being that Special Relativity the requirement of Absolute Time in Classical Physics not to be valid. General Relativity Theory and Quantum Mechanics are the remaining theories from which a more complete Physics explaining reality is expected to be found. During the search for that explanation with one of these two incompatible theories, I believe science has established principles and observations sufficient to demonstrate the rejection of Absolute Time as premature. Reevaluating excepted facts of current physics can establish a Local Absolute Time, including a locally preferred frame of reference. And from that foundation, a universal Absolute Time should be a realistic expectation of reality. The case for both these versions of Absolute Time is made here.

Unrealistic Views

All three of the dominant scientific theories of physics have some unrealistic element that will necessarily prevent them from defining a reality based on a realistic three-dimensional Euclidean universe. General Relativity resolves the problem of gravity by establishing a non-Euclidean curve in space-time with direct interaction required between elements of mass, an approach that allows mass-less photons to be involved as well. Mass and even energy can define what we are allowed to know about the curvature of this additional “spacetime” and what from that information we can predict and understand how mass and energy will behave in those almost hidden curves. However, it appears the theory includes a fundamentally independent background, making a complete realistic solution impossible without a dependent background or some new guiding principle being defined. Quantum Mechanics on the other hand, expects a more realistic view of gravitons to account for gravity with direct exchanges between elements of mass producing the effects of gravity. No extra dimensional curvature of something unseen in our perception of reality is required. With dramatically different and incompatible interpretations of how gravity works, most do not expect the two theories can be combined without a significant revision to one of them. Quantum Mechanics, based on the uncertainty principle, has its own unrealistic methods to accurately predict and describe weird actions at a distance. Including a variety of different interpretations to explain how observations of apparent entanglement might be explained in different ways, but all unrealistic, as we traditionally define realism.

This brings us back to Classical Physics, which must also be considered unrealistic. Classical electrodynamics was always based on mathematical continuous fields, extending distances from the involved particles with interactions at a distance accurately described mathematically. But no matter how accurate the predictions, realistic description of those fields were never established. One of the hopes of General Relativity was that field theories of gravity and electrodynamics may match together in a more complete description of reality. Even if it might indicate that reality

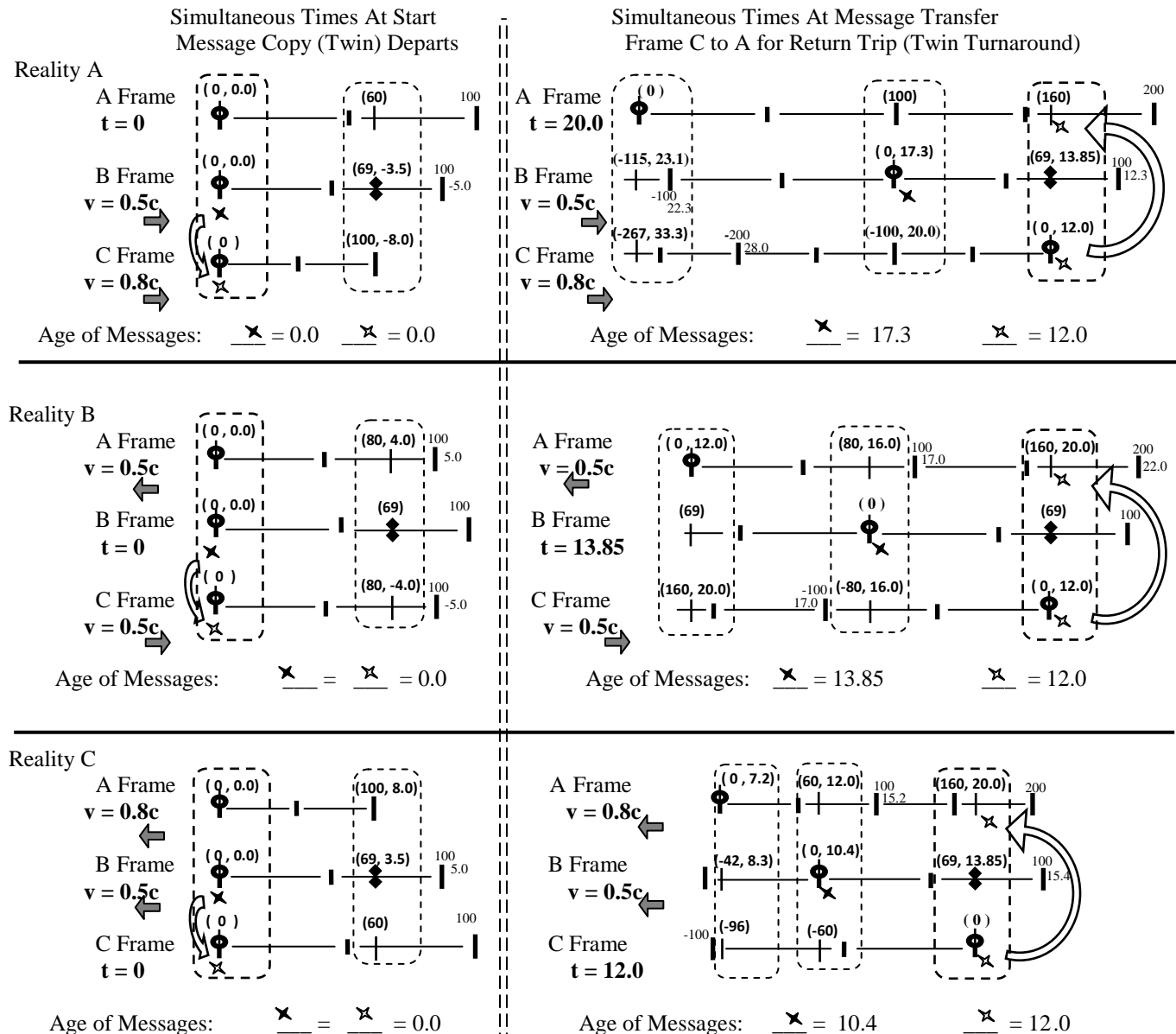
itself did not follow traditionally defined realism. While some efforts to that end may continue the Special Theory of Relativity at the foundation of 20th-century Relativity Theory was successful in eliminating Classical Theory as a viable foundation for completing our understanding of physics and reality. It did so on two major points, first by demonstrating that nothing can travel faster than the speed of light, requiring the Newton formulas for gravity be revised to remove the unrealistic requirement inherent in them that the effects of gravity between distant masses be communicated instantaneously. Also, the classical expectation of an Absolute Time was established as having no objective physical reality by the simultaneity principle.

Special Relativity & Simultaneity Principle

It is from here that the concept of Absolute Time will be reevaluated, without unrealistic classical expectations, but only considering what can be shown as realistically real. Based on confirmed principles of Special Relativity established over 100 years ago, and realistically applying excepted facts, particularly about the Big Bang, that has been established since then. Unfortunately, the Principle of Simultaneity established by Special Relativity is not well understood and is frequently misapplied. Our first step needs to be making clear what simultaneity means, best done with a more complete description and diagram on the next two pages of the relativistic “Twins” paradox. Most explanations are simply incomplete and failed to demonstrate the most important aspects of what is meant by simultaneity in Special Relativity. The two pages on the **Simultaneity of time** in three reference frames A B & C; show how all three frames can observe reality in a manner that allows them to think that they are the “preferred frame” while all other frames have a distorted view and incorrect synchronization on their clocks. Most important to recognize is that each frame will understand that the other frames although incorrect will proceed themselves as also being “the preferred frame” where all other frames show units of measures as shorter and rates of time, as slower. This is key for each frame to understand that their version of reality cannot be confirmed as correct by any objective measurement.

This key principle of simultaneity that no individual reference frame can be trusted as a correct view of real simultaneity is often not properly recognized. The Andromeda Paradox is an example that frequently does not get the rules of special relativity correct. Looking at the starting conditions under “Reality B” where all the times in the B frame all simultaneously read “zero”. Frame B observes that spaceships leaving from the station 69 ly (light years) away at $t=0$ would be simultaneous with all three “0” observers seeing each other. The Andromeda Paradox claims that an alternate reality is occurring for each traveling visitors A & C, where the ship departure at station 69 ly in frame B is happening either 4 decades in the future or -4 decades in the past. But that is what Frame B sees as errors in moving clocks. Special Relativity just shows a different opinion of what is happening simultaneously under “Reality A” not that both realities are in fact “real”. There both the actual measure of time and distance to station 69 that the B frame is using is simply identified as being wrong. And as defined by Special Relativity the visitor passing by in the C frame will also assume the other two frames have defined distances and times incorrectly as well. Nothing in SR implies that events happen in both the past and the future. The point made by SR within the rules of simultaneity is identifying which of the various possible reference frames, should in reality be considered correct cannot be done. And no frame should consider itself preferred or define such a paradox.

It is easy to create supposed Paradoxes like backwards time by assuming more than one frame “is correct” but they should not be thought of as based on Special Relativity. Such ideas distract for the real point in Special Relativity such as the importance of local occurring events as being truly simultaneous .



Simultaneity of time in three reference frames A B & C (Simultaneity pages 1 & 2)

In empty space frames move along an alignment with the North Star at the right.

All Times are shown with a decimal point! Distances are always whole numbers.

Ten units of distance are defined by distance light travels in one unit of time:

- therefore, if time units is a decade, a unit of distance is one Light-year,
- or if distance units are feet, a unit of time would be 10 nano-seconds

Twin transfers can be considered as “Messages” where the receiving frame sets a stopwatch to the message stop watch time in the sending frame. Age of a message and the “twin” messages is on the stopwatch local to the message. Stopwatch is set and started at each transfer, and works normally in the local frame of reference.

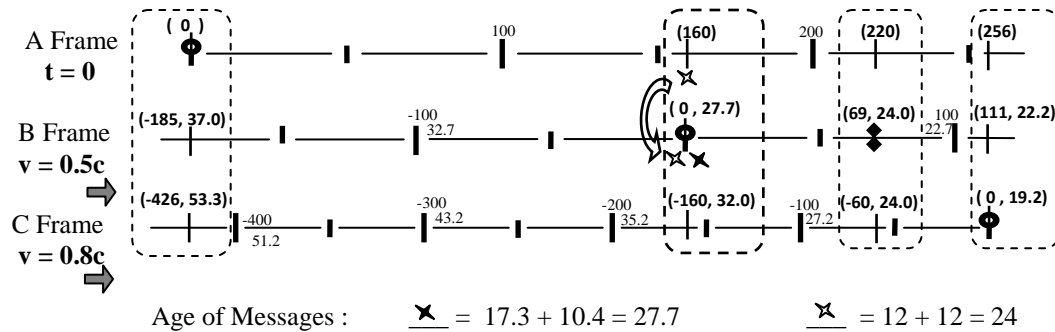
No acceleration effects are needed, all frames are in inertial motion, with transfers planned and coordinated

- Frame C “0” is to use the Transfer Site 69 in the B Frame to transfer a copy to Frame A, where it will be taken back for return transfer to Frame B “0”

Simultaneous Times at Message Return "Twins Reunite"

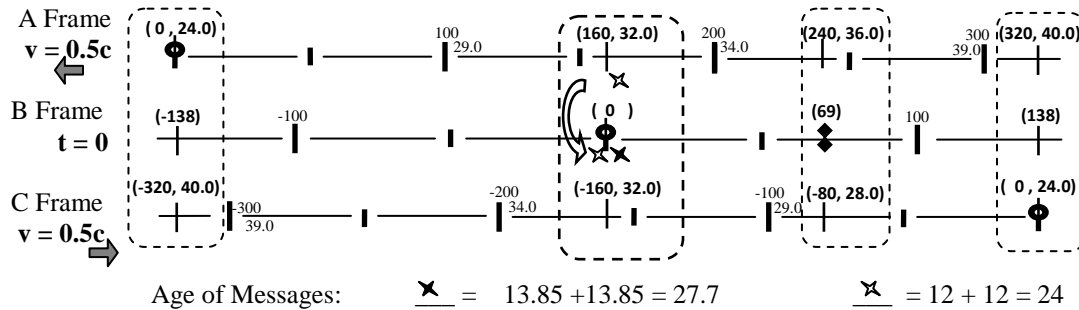
Reality A

⇒160GHz
CMB
160GHz⇐



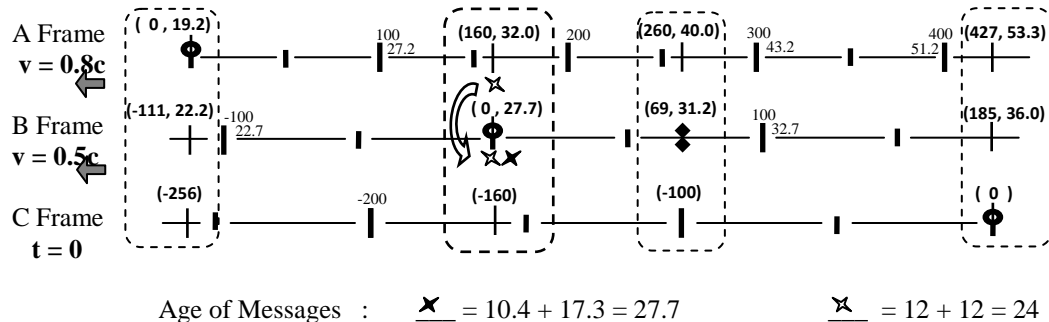
Reality B

⇒93GHz
CMB
277GHz⇐



Reality C

⇒53GHz
CMB
480GHz⇐



Simultaneity of time in three reference frames A B & C (Simultaneity pages 1 & 2)

Each frame has all clocks synchronized using light signals, and the leaves each of their own clocks are simultaneously reading the same time. They do not assume clocks in the other frames are leaping into the future or traveling into the past. Each frame can see and measure that clocks in other frames are running slow. Therefore, the other frames must set their clock synchronization's incorrectly in order to all I'll be incorrect slow passage of time on their clocks to give the other frames the false impression of being synchronized.

Each frame can establish spheres of simultaneity, but no two frames can establish the same sphere. However, when ever an event occurs. All three frames concur on the times and locations in each of their frames when an event occurs and is observed locally. And everyone at a distance from their local observations will concur. Here all three frames agree when the transfers took place, but all disagree on what was happening when simultaneous with those transfers at any of their distant locations.

Thus the rule of simultaneity establishes that only collocated events such as when three observers see each other, can be considered truly simultaneous. No objective measurement within the rules of Special Relativity can establish a distant event as actually simultaneous with a local event, a preferred frame cannot be defined.

That is until we consider how Special Relativity must define the CMB surface of last scattering.

Reconsidering the invalidation of Absolute Time

It is based on the inability to define a preferred reference frame that further progress on relativity required of assuming that no such preferred frame could be defined. In effect Special Relativity to find all reference frames as equal in their inability to define themselves as preferred, nor able to identify any other reference frame as preferred. For a complete description of a realistic reality, which reference frame defines unit lengths as the longest should not be an arbitrary selection, where there is no correct answer. In this sense, Special Relativity and General Relativity growing from it must be considered unrealistic. To recover realism, what is missing is the ability to actually define, which reference frame is preferred, and it must be able to be identified correctly from any reference frame so that a principle can be defined usable from all frames. Over the past century astrophysics has developed what most refer to as an arbitrary measurement metric based on the distant stars. Starting with measurements by Hubble, that define Hubble expansion the metric continues to be gone, more accurately defined and in recent decades is defined by the Cosmic Microwave Background CMB. Few things in the cosmos have been more precisely measured and theoretically confirmed as part of the Big Bang and coming from a Surface of Last Scattering SLS only 375,000 years after the start our Universe now over 13.5 Billion years old. The question should now become why should this metric, be considered arbitrary?

The Last Scattering occurred uniformly throughout the know universe simultaneously shortly after the Big Bang itself. These events should be considered as matching the requirement of simultaneous events defined in Special Relativity itself. The simultaneous events that occurred closer to us have already passed by, and the CMB radiation seen now represents a distant surface, we are only now able to see a surface. With a larger and growing surface to become visible to us from the same simultaneous event as time passes. Our ability to define the age of the universe is fundamentally based on this. Almost all we know and believe about the early beginnings of our universe depends on the SLS coming from a single simultaneous set of events. If we are to accept how we define the beginning of our universe, then we should allow our observers in the two page message twins example given above to “look outside the box” of special relativity and evaluate the CMB in coming from the South (left) and the North (right). Listed on the second page of the Simultaneous Times example is a block of CMB observations observed by each of the three different reference frames. Observers in frame C measuring and asymmetrical CMB of 53GHz vs. 480 GHz if they continue to use the rules Special Relativity would conclude from those numbers that they correct preferred frame must be traveling to the left at a speed of $0.8c$ with respect to themselves. Observers in Frame B would agree based on the frequencies they observed that the preferred frame would be moving to the left at a speed of $0.5c$ from what they perceive as stationary. And of course, the Frame A observes in observing a 160 Ghz CMB both North and South as well all other directions could now that at in the local league of space they were on the “Preferred Frame of Reference”. And by using the SR rules they could predict the readings the other two frames are observing. Establishing a preferred frame does not create a false physics in the other frames if, as the SR rules and CMB allow, can enhance the Physics rules to allow every frame to equally find the same preferred frame and use that knowledge to make equivalent predictions. That would be a more complete and realistic interpretation of physics and reality.

Along with that comes an “Absolute Time in the Local Space” as the best definition of the correct maximum rate for the passage of the rate of time in the local space would be defined by that preferred frame. Since we know from Hubble that in the distant past, local space would have been denser with absolute rate of time within that space would have been slower. As the universe ages we should expect the rate of Local Absolute Time to become faster, and a more advanced analysis

of what that limits might be could give us a clue to what a universal Absolute Time might be. Identifying and recognizing a usable Local Absolute Time can allow a reevaluating our ideas on gravity with a more realistic view without using extra dimensions.

Realist interpretations may become possible

Newton only had data indicating that orbits like Mercury remained stationary with respect to the stars. Believing that as correct, would only allow the formulas as he made them. But if he had seen or just speculated that there was something like gravitons as we now speculate how might he have changed his predictions. In the following page on "Elliptical Orbits Reconsidered" four versions of Gravity are discussed including how gravitons of a finite speed might affect the inbound vs. outbound portions of an elliptical orbit. The difference between Mercury Aphelion and Perihelion of 23815700 km give a travel time delay of about 80 seconds at light speed. With half an orbit taking about 3845000 seconds that gives an asymmetry of about 1 in 48,000. A very small amount, but in the same order of magnitude, 1 in 30,000 as the 43 arc-sec of precession compared to a full orbit.

Even in circular orbits, traveling a finite speed cannot be expected to reach an orbiting satellite by traveling across the exact center of the objects orbit. More noticeable when both bodies are near the same mass even large objects, like the sun, "wobble" due to smaller orbiting bodies. The orbit of both bodies will always mean, they are receiving finite speed gravitons at something more than a inverse r^2 that would also need to be accounted for, in a tradition realist Euclidean analysis. These effects can become dramatic when considering very high speed high mass objects that so far have only been seen in elliptical orbits. A binary pair of pulsar mass solid objects is not something we can expect to find or observe. But a hypothetical analysis in a simple graphic of such solid objects in a close high-speed circular orbit shows how the real distanced gravity would travel would be less than the full diameter of the circular orbit. The simple graphic shows how the gravitational pull would be in a geometric position to increase the speed of orbiting and lower the orbit size. While this would seem to violate the conservation of angular momentum, that may not necessarily be the case. The left side diagram shows the solid masses as not rotating. But it is much more likely that, as shown on the right, the rotation of solid objects in such an orbit would lock and each object's rotation would increase in speed as the angular momentum decreased with smaller and faster orbits. And increasing spin or rotation in the objects would represent an increase in angular momentum that might compensate for the loss of energy in the orbit. There is the possibility that there may be no energy loss to produce "gravitational waves" as expected in some interpretations. Certainly considering only the reduction in orbital size without considering how the spin energy of the objects in orbit might be changing is not enough to assume that gravitational waves are taking energy away from the system.

In conclusion there seems to be more than ample justification for considering what we already know about the Big Bang and CMB to allowing defining Local Absolute Time in preferred frames of reference. Preliminary views indicate that. Especially when it could allow for more realistic interpretations using such Absolute Time without requiring the use of extra dimensions do give results pointed in the correct direction. The opportunity to move toward more realistic explanations that could produce results matching current unrealistic approaches and move Physics into a much deeper and clear understanding of reality.

Elliptical Orbits Reconsidered

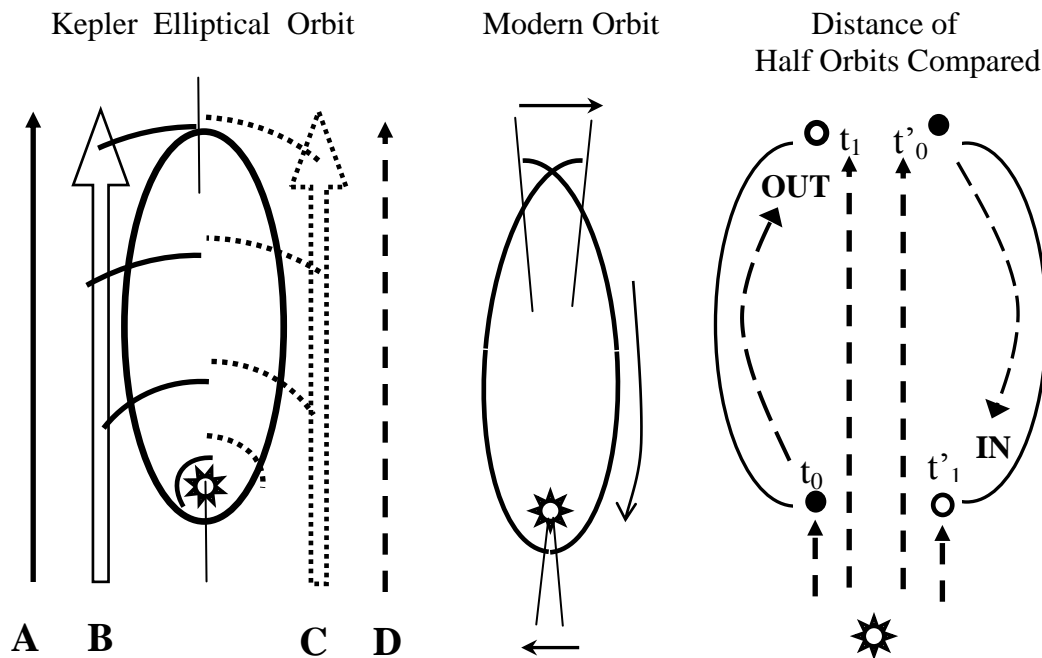


Figure 1: Elliptical Orbits and how 4 types of Gravity “work”.

- A:** Newton’s Gravity; a direct connection at a distance or unrealistic “infinite speed”
- B:** Gravitation Fields; a physically indefinable continuous fields with inverse r^2 strength.
- C:** Warped Gravitation Fields; curved extra dimension near masses increasing inverse r^2 field strength.
- D:** Standard Model; a physical particle (Graviton) transmits gravity

The Kepler Elliptical Orbit described planetary orbits prior to 1800 with the perturbations of other orbital objects removed. Modern Orbit accepted by the end of the 1800’s based on direct observations that confirmed after removing perturbations of other Planets comets and the possibility “Vulcan” showed Mercury had a unaccounted for precession, now known to exist in all orbits as shown above. Descriptions A & B of gravity mathematically account for the original observations and expectations of the Kepler Orbits. The General Relativity Theory mathematically using a non-realistic geometry defining Gravitational Fields with extra dimensional curves have been the only successfully description to correctly describe observed effects of gravity.

However if graviton particles are used to account for gravity and are assumed to only travel at the speed of light standard calculus would require a different integration of how many gravitons should affect a mass in elliptical orbit. Shown on the right are the outbound and inbound halves Colin elliptical orbit. During the outbound phase from t_0 to t_1 , not all of the gravitons needed could reach the object in just one half the orbit time. Also during the inbound portion of the orbit additional effects of gravity would be accumulated from gravitons already on Route within the longer t'_0 arrow as the orbit closes into the t'_1 distance. This simple asymmetry, due to the time delay of gravitons covering the distance between Periapsis and Apoapsis may be all that is needed to account for precession.

