Removing Relativity

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July 21, 2020

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Introduction

This document offers the basics of Einstein's theory of general relativity and how it is applied to the context of the universe.

For example, black holes were described by both Einstein and Hawkings, and are claimed by many as being observed.

Basic Assumptions

Some advocates of relativity believe in the adage: “Spacetime tells matter how to move; matter tells spacetime how to curve.”

This is the basic assumption for the active behavior by spacetime, because it “tells matter how to move.”

It is difficult to believe anyone well educated with the science of physics would accept or believe that assumption.

In physics, bodies in motion possess kinetic energy and thermodynamics describes different transfers of energy. A coordinate system cannot hold or transfer energy.
An external force on a mass results in its acceleration, as represented by the formula, F=ma.

Matter moves as directed by a force, not as told to move by spacetime.

Relativity has 2 other crucial assumptions:

1) Mass cannot exceed the velocity of light,

2) Gravity propagates at the velocity of light.

Item (1) was an assumption also held by others but it had no experimental justification.

Item (2) resulted in the new concept of a gravitational wave. Isaac Newton never proposed gravity could have a delay.

There is more to relativity and its wrong assumptions.

Excerpt from Wikipedia:

The development of general relativity began with the equivalence principle, under which the states of accelerated motion and being at rest in a gravitational field (for example, when standing on the surface of the Earth) are physically identical. The upshot of this is that free fall is inertial motion: an object in free fall is falling because that is how objects move when there is no force being exerted on them, instead of this being due to the force of gravity as is the case in classical mechanics. This is incompatible with classical mechanics and special relativity because in those theories inertially moving objects cannot accelerate with respect to each other, but objects in free fall do so. To resolve this difficulty Einstein first proposed that spacetime is curved. In 1915, he devised the Einstein field equations which relate the curvature of spacetime with the mass, energy, and any momentum within it.

(Excerpt end)

Observation:

This expectation of free fall acceleration is **totally** wrong when beyond Earth.

When a force is applied to a smaller mass to raise it to a distance above a larger mass, this smaller body has gained potential energy while still subject to the force of gravity from the larger body.

When the smaller or lighter mass is released so at this instant it has no other forces, then this happens: only the lighter mass accelerates toward the heavier mass. The heavier does not accelerate toward the lighter because the heavier never obtained any potential energy.

Free fall acceleration has a very limited context. It involves a subsequent motion of the lighter body while remaining subject to the force of gravity from the larger mass.

There is never a time when there is no force on the lighter mass.

On the celestial scale this free fall behavior can never occur.

First a lighter mass must be on the heavier mass, before it was lifted off to gain potential energy toward the heavier mass. Each mass is in motion based on external forces.

Every celestial body in the universe is NOT simultaneously in free fall acceleration toward every other body in the universe.

Every celestial body in the universe does NOT possess potential energy toward every celestial body in the universe.

Relativity cannot replace the force of gravity with just a gravitational field and its free fall acceleration which can arise only within a defined scenario between a heavier and lighter mass.

Relativity just ignores this mass relationship for this behavior.

Relativity is just an attempt to evade the force of gravity equation which requires 2 known mases and their instantaneous distance.

When assuming gravity cannot be instantaneous, this instantaneous distance is a crucial problem.

The force equation would require a propagation delay for the application of this force between two bodies. Relativity, by proposing only a gravitational field, defines a specific context.

Relativity evades the consequences of its false assumption about a velocity of gravity.

Time definition

Time is a measurement. Time is not a thing which can be created or destroyed
Time is not motion but time is used to measure motion.
Chemical reactions are not instantaneous but we use time to measure them.
Chemistry has nothing to do with motion.

60 seconds in a minute probably came from counting a person's pulse.
"A normal resting heart rate for adults ranges from 60 to 100 beats per minute."

If anyone needs an approximate time measurement they can just count their pulses to count a number of seconds (though not exact).
Performing this count does not create time.

The current date and time are a reference with both incrementing at a defined rate. They describe my current now as part of the measurement of event sequences in the universe. There is only now and it is impossible to pick a different time for now, except for an accepted change like the daylight savings time adjustment. Essentially we agree to change the time of noon or the Sun at its highest compared to the Sun rise. Earth's axial tilt results in changes in the time elapsed between sun rise and sun set. Our time of day does not begin with sun rise but the 24 hours in one rotation are roughly centered on the highest sun, with 12 before and after.

Changing the date and time for now does not mean my now has changed to a different now.

If someone says time travel is possible that is like saying one can change a watch and calendar and magically physically move to a new date and time as selected.

There is no time travel.

Describing a Position

The observer selects or defines the coordinate system based on the requirements for a measurement.

In a laboratory for an experiment, the simple Euclidean geometry is often used.
3 linear dimensions are defined with the desired scaling. 3 letters are often used for the 3 linear dimensions, with x for left/right, y for up/down, z for in/out. The scaling is also defined, such as mm or inches, or perhaps much longer increments.
The respective dimensions must be referenced to physical space.
One example is X0, Y0, Z0 is often at the lower left corner of the working space; alternately X0 could be defined at the middle of the working space. This definition allows someone else to repeat an experiment exactly, by recording the positions using the same coordinate system definitions.

Time is sometimes considered a 4th dimension. To measure motion, the time difference between position measurements enables the calculation of velocity (distance per unit of time).

For measuring positions on Earth, the respective observers can use the GPS coordinate system so measured positions can be shared and repeated. The GPS coordinate system is referenced to the center of the Earth.

For measuring positions in the universe, the respective observers can use the celestial coordinate system so measured positions can be shared and repeated.

Excerpt from Wikipedia:

A celestial coordinate system is a system for specifying positions of satellites, planets, stars, galaxies, and other celestial objects. Coordinate systems can specify an object's position in three-dimensional space or plot merely its direction on a celestial sphere, if the object's distance is unknown or trivial.

(Excerpt end)

Observation:

The celestial coordinate system uses two dimensions having angular values.
The celestial coordinate system is referenced to the center of the Earth but is offset by the observer's current position on Earth's surface and their local time; this transformation enables its consistency during Earth's rotation.

A third linear dimension for the distance to the object allows the complete description of an object's position anywhere in the observable universe, using Earth as the reference.

Types of Motion

a) Commanded motion

The observer can define a coordinate system to measure the current location of any object including oneself.

After the observer's coordinate system is anchored to physical space, by using a reference point at a physical location for each dimension, the observer can use the dimensions for accurately describing an intended motion in relation to that reference point, a real position in real space.

b) Measured motion

In classical or Newtonian physics, objects are moving subject to external forces. None of these objects are in motion using a coordinate system. No motions are executed using coordinates for the destination like moving from one coordinate to X1.2, Y2.3, Z3.4. Every object is in either motion or stopped, based on the sum of all forces acting on it. Bodies in motion can have their position measured at intervals to calculate their velocity, from a measured distance over a measured time. The 3 fundamental forces of gravity, electric, and magnetic all act by the inverse square of distance so each force decreases as the distance increases.
Every force on a mass has a vector for the resulting acceleration. This force can be any of the 3 fundamental forces: gravity, electric, magnetic.

When knowing the mass, charge, and distance for each relevant body these forces can be calculated.

When knowing the force and mass, the acceleration can be calculated.

c) Coordinated motion

The gravitational slingshot trajectory of a space probe is an example of coordinated motion, or simultaneous motion.

When NASA calculates a trajectory of a space probe it uses the force of gravity as defined by Newton.

Universe Today had a 2014 story titled "How do gravitational slingshots work?"

The story describes how NASA calculates these slingshots to execute a change in a probe's trajectory around a moving planet. NASA has certainly demonstrated their technique with numerous successful missions.

The calculation of a slingshot involves these critical values:
a) the mass of the probe

b) the mass of the planet

c) the velocity of the probe

d) the velocity of the planet.

During the probe's approach there is the mutual force of gravity between the two bodies where the paths of both bodies are affected simultaneously. Obviously, the probe with a rather small mass is affected much more than the planet.

These calculations are based on Newton’s gravity.
Our solar system has all the bodies simultaneously rotating around the instantaneous center of gravity, also called the barycenter.
Relativity is based on space-time curvature driven by a gravitational field. A gravitational field provides free fall acceleration toward that body which is spherical having uniform density. Conforming to those rules, this body exerts this field which can be calculated from the mass density and radius.
The mass of the observer, a smaller mass than the main body, is not involved in this free fall calculation.
The heavier body will not free fall toward the lighter body.
On Earth, applying a force to a body to lift it gives the body potential energy. Upon releasing the body it will have free fall acceleration toward the heavier body. That free fall behavior is not part of this calculation for a space probe.

NASA never uses a gravitational field in its calculations for a slingshot trajectory. NASA does not use space-time curvature.

Relativity assumed gravity had a velocity limit of c. NASA assumes gravity is instantaneous, when using the Isaac Newton equations which have no variable for time.

The gravitational slingshot is confirmation of Newton’s gravity.
The fact astronomers predicted and discovered the planet Neptune in 1846 verified Newton’s force of gravity is correct.

The barycenter behavior in our solar system is also confirmation of Newton’s gravity.

Space-time curvature requires commanded motion by the moving observer when the commanded path is curved.

During the barycenter coordinated motion, with no moving observer present, space-time is quite irrelevant.

That suggests relativity is the wrong theory for the evidence.

There has never been an observation where space-time correctly matches an observation when gravity did not.

There is no evidence for space-time while the force of gravity consistently has the evidence.

Travel Of Light

Visible light is part of the electromagnetic radiation spectrum being generated by synchronized, perpendicular electric and magnetic fields which propagate through a vacuum at the measured velocity called the constant c. These fields have a period of oscillation measured as either wavelength or frequency. The wavelength is often measured in nanometers. This propagation velocity can be reduced by the medium by a factor called the diffraction index.
Light is not a particle and has no mass so a change in the medium will cause an immediate change in the velocity. This behavior is observed with light bending at the surface of water in a glass.

A prism demonstrates light is inherently a wave because particles would not spread in a coordinated manner as observed; only a wave propagating in a medium matches the observation. Any behavior where light might appear as a particle is due to the circumstances of the observation.

Light will always propagate in a straight line unless the width of the beam propagates through a medium having changes in the medium across the beam's width, like in a prism.

Absorption and emission lines in a spectrum are not a particle behavior. They are either a measured wave length or frequency within the continuum of radiated energy. A continuum cannot be quantized.

A photon is just an abstraction of one wavelength of light.

Light can never exhibit the behavior of commanded motion. Light cannot follow the dimensions, or travel to a particular coordinate, within a defined coordinate system.

The force of gravity is the mutual force of attraction between two defined masses.

The propagation of light, which is not an entity having mass, is never affected by the force of gravity.

Space-time Definition

Relativity is a theory defined to be background independent.

Excerpt from Wikipedia:

Background independence is a condition in theoretical physics, that requires the defining equations of a theory to be independent of the actual shape of the spacetime and the value of various fields within the spacetime. In particular this means that it must be possible not to refer to a specific coordinate system—the theory must be coordinate-free. In addition, the different spacetime configurations (or backgrounds) should be obtained as different solutions of the underlying equations.
(Excerpt end)

Observation:

This “coordinate-free” basis is appropriate for the theory of relativity because relativity describes changes to only the moving (or non-inertial) observer's reference frame, or their 4-D space-time.

Relativity never uses or needs the background coordinates for the observer.

The underlying equations are also important because they demonstrate the context on the moving observer.

The moving observer gets the space-time curvature. Space-time is a coordinate system having 4 defined dimensions: ct, x, y, z.

This is the Euclidean geometry but with a 4th dimension ct allowing time to be introduced as a linear dimension (when multiplied by c) with units compatible with the other 3 having standard linear dimensions.

The commanded motion of the moving observer is being manipulated by the observer's motion in a gravitational field.

The combination of change-x, change-y, change-z, change-ct are used to calculate the space-time interval for the geometric transformation done in Einstein’s equations.

This transformation involves only changes in the observer's position and never uses a reference to a physical location.

The differential inputs into the metric tensor are: cdt, dx, dy, dz.

These represent the change in the moving observer’s position for each increment of time during that motion.

This incremental motion described using differentials is integrated over a period of time to get the path of motion.

This description is a simplification but sufficient, because it has the important details.

Relativity does not require a connection to a coordinate in physical space, when working solely within the context of the moving observer’s reference frame and manipulating the path of motion within that context.

Isaac Newton is said to have worked in a background dependent context with absolute space and absolute time.
In other words, objects could be described by their coordinates in physical space. Time is a measurement completely independent from a position in space,

The terms of geometry enable the definition of the observer's coordinate system, with its dimensions or axes and their scaling.
These dimensions are connected to physical space by relating each to a particular point in physical space. A simple example with the Euclidean geometry is defining coordinates X0,Y0,Z0 at the lower left corner of one's working space. The observer selects the scaling, such as inches or mm.

In this case, the coordinate system has become background dependent by defining its coordinates in physical space.

This is the context often used by an observer in a laboratory.

To become background independent the observer must make all measurements of changes in positions relative to the observer’s location without ever needing to define an absolute position of any objects.

In Newtonian physics (i.e., not relativity) when used for cosmology, the context of background dependence is convenience. Each behavior in Newtonian physics is usually connected to a specific point in the physical space of the universe. The observer defines how the positions are measured when the reference point in space is selected. This reference point could be in a laboratory or in distant space
The forces of gravitational fields, electric fields, magnetic fields are all based in movable objects and are never required to be anchored to a point in physical space. The distance is crucial for these forces. Their position in physical space is not important. Gravity works the same on Earth, the Moon or any other place in physical space.
I Newton’s equations were applied in a background independent context, there is no coordinate system to define the dimensions required to measure a position.

Without defined positions, only distance measurements are possible, so any position is relative to another. The 3 fundamental forces use only a distance, never a position. This context of only distances is possible, but impractical and essentially ineffective and certainly inefficient. The easiest distance calculation with 3 dimensions is the comparison between their respective coordinates in the defined coordinate system using the observer's scale for each dimension, using basic trigonometry.
In the GPS spherical coordinates, the radius of the earth is the linear distance for the hypotenuse of a triangle. The sine function with either the latitude or longitude angle enables the calculation of a distance on the surface for that angle, or on the surface by that radius. In practice, maps use scaling so one unit of measurement is proportional to an actual distance, like x inches per mile.

Instead of a Euclidean geometry or the GPS dimensions, a similar technique is used for the celestial coordinate system where the two planes are related to the fixed point at the center of the Earth. Observers around the world can adjust this coordinate system for their location relative to the center of the earth.
In the celestial spherical coordinates, the known linear distance from Earth is the hypotenuse of a triangle. The sine function with either the Declination or Right Ascension angle enables the calculation of a distance between objects for that angle.

This is the typical background dependent context for a coordinate system usable by anyone on Earth.

Relativity uses the concept of frame of reference.

Excerpt start:

The motion of a body can only be described relative to something else—other bodies, observers, or a set of space-time coordinates. These are called a frame of reference.

In physics, a frame of reference (or reference frame) consists of an abstract coordinate system and the set of physical reference points that uniquely fix (locate and orient) the coordinate system and standardize measurements.

(Excerpt end)

Observation:

This "abstract coordinate system" can be the observer's context, and in relativity it is. Relativity implements its space-time curvature as changes in the observer's frame of reference.

Excerpt start:

General relativity generalizes special relativity and refines Newton's law of universal gravitation, providing a unified description of gravity as a geometric property of space and time, or spacetime. In particular, the curvature of spacetime is directly related to the energy and momentum of whatever matter and radiation are present. The relation is specified by the Einstein field equations, a system of partial differential equations.
(Excerpt end)

Observation:
A statement above is misleading because it omitted critical words. It should be fixed like this with the added text in < > :

In particular, the curvature of < the observer's> spacetime is directly related to the energy and momentum of whatever matter and radiation are present < at the observer >.

This distinction is very important.

Curvature is NOT related to whatever matter and radiation are present ANYWHERE. The curvature is directly related to the moving observer. This is just semantics but it should be correct and clear.

Relativistic behaviors affecting the observer's space-time do not apply to the physical universe when limited to the observer’s reference frame.

However, cosmologists consider space-time as a real thing, which is clearly a mistake.

Excerpt from Wikipedia:

The shape of the universe is the local and global geometry of the universe. The local features of the geometry of the universe are primarily described by its curvature, whereas the topology of the universe describes general global properties of its shape as of a continuous object. The shape of the universe is related to general relativity, which describes how spacetime is curved and bent by mass and energy.
(Excerpt end)

Space-time on the scale of the universe is NOT a 'continuous object' with a shape.
Space-time is defined to be the special observer's geometry affected by their proximity to 'mass and energy' but there is no geometry of the universe.
The observer's space-time geometry is background independent with no link to the physical space. It cannot be a real thing.

Space-time as a Continuous Object

The Space-time as the fabric of space cannot be verified to be real.

There is a simple rule for a thing to be real. It must be measurable by everyone from anywhere.

If there is a privileged observer who claims they have a thing which only they can measure, everyone else should ignore the claim, even laugh at it.

Physics relies on evidence which is obtained by a measurement. Anything which cannot be measured is also a thing which cannot be claimed to be real. Forces can be measured even if not visible.

Real objects do not rely on a specific observer. Others must be able to observe and measure it.

If one person gives a box to another person and they can measure it with the same values (every measurement method has a margin of error), then obviously they can agree this box is real. (A weight anomaly from the observer's altitude is not relevant because the thing has an attribute measurable by all.)
The crucial requirement for determining the reality of an object is whether it can be measured independently of a specific observer.

There is a multitude of mechanisms to measure point-to-point distances, with the result independent of the person using that mechanism.

Here on Earth, we have 2 position measurements available which are independent of a particular observer.

1) The GPS coordinates have the latitude and longitude planes referenced to the fixed point at the center of the Earth.
The elevation measurement is also referenced to the center of the Earth.

The latitude, longitude, elevation measurements can be made for any point on or around the globe, independent of one observer.

2) The celestial coordinate system has the declination and right ascension (RA) planes referenced to the fixed point at the center of the Earth.

Each observer does a coordinate system transformation for their current position on Earth's surface relative to that fixed point at the center of the Earth.
The distance measurement is also referenced to the center of the Earth.

The declination, RA, distance measurements can be made from any point around the globe, independent of one observer.

Using this Earth-based coordinate system, we can agree on what is measurable and real in our observable universe.
If we cannot measure something independent of a particular observer then it cannot be verified as real.
Right now, the only way to measure anything anywhere in the universe requires an observer on Earth. A space probe leaving Earth can still use the celestial coordinates by accounting for its position relative to Earth.

Probes in interstellar or intergalactic space making celestial position measurements will be challenged to use Earth as a reference for those measurements. Alternately a somewhat fixed point could be used.

A galactic coordinate system has been defined but the moving Sun is its center so it has a restricted basis to be used for references beyond our galaxy.

Observation:

The New Horizons probe traveling to Pluto took an image of Messier 7 for its first calibration of its LORRI camera. That observation required a known location, compared to Earth, for the probe to correctly observe that open cluster in distant space when far from Earth.

We cannot verify any claims of anything as real beyond our observable universe. This statement is simple logic.

The fabric of space, or an instance of space-time, is claimed to be created with the big bang. For a legitimate claim as being real, this fabric must be measurable independent of one privileged observer.

To meet this requirement, a universal coordinate system is required, or one not using Earth as its reference point. Its dimensional planes and a distance from that point must be referenced to a specific fixed point in the universe.

Currently, it is impossible to determine limits on the size of the universe so it must be treated as having no limits (or infinite).
It is impossible to identify a fixed point within any space having no defined limits.

There is no fixed point in the universe to serve as this required reference for the defined dimensions.

If we ever, somehow, define the limits on a finite universe, then it becomes possible to identify a fixed point within that finite volume.

Until that time, it is impossible to define an observer independent coordinate system for the universe.

All measurements for cosmology require an observer to define the dimensions and their reference point in the observable universe.

Space-time is the moving observer's reference frame. When confined to that context, the observer's current position in space is the reference for the space-time dimensions. Space-time is explicitly an observer dependent coordinate system.

Relativity is a background independent theory meaning it has no reference to any physical coordinates in the background of the observer. Though relativity is the basis for popular cosmology, relativity has no role in verifying aposition independent of a special observer.

Therefore the fabric of space cannot be verified as real because it requires a particular observer who must use the Earth for measurements. This requirement for verifying a real thing is crucial.

Cosmology claims to explain the universe using relativity and this can appear possible now within only the observable universe simply because we are all on the Earth which is the basis for our measurements.

The claim of a fabric of space is reaching too far to justify. It cannot be measured beyond a reference to Earth.

The big bang is claimed to create a continuous object, or the fabric of space, which cannot be verified as real.

All cosmological claims based on a fabric of space, as a continuous object, have no real basis when that fabric cannot be verified, by a measurement, as real.

If the fabric is claimed to be infinite in size and it is also expanding, but with means to measure anything about it, then the claim is ridiculous.

Space-time in the Physical Universe

Space-time cannot be anchored to the physical universe other than through the moving observer whose background independent coordinate system is affected only by local relativistic effects. More about this is below.

The universe is infinite and everything in it can be moving.

It is absolutely impossible to identify a single fixed point in the universe to anchor a proposed coordinate system of the universe.

Any attempt at such a coordinate system must begin with the observer. That means as the observer moves, this coordinate system of the universe is moving as well, so its respective axis planes could be rotating and their references shifting.

Cosmological measurements are based on the observer.

In the big bang cosmology, space-time of the universe was created by the big bang event.

Actually space-time is limited by relativity to the moving observer so the big bang cannot create space-time because only a moving observer has their own space-time, distinct from all other observers
Despite that inherent restriction in relativity, this big bang theory proposes an instance of a moving observer's space-time was created and this 'thing' is a continuous object whose shape can be described by space-time.

If this space-time is a real thing then it must have a physical location in the universe where we can measure it, as evidence.

Even stranger, cosmologists propose a thing called time in this universal space-time was created with the big bang. Time is not a real thing; it is only an incrementing count, typically used for defining a start and end time for a measurement of the delay between them. Isaac Newton considered time as separate from space and he was correct.

The confusion about universal space-time worsens.

The space-time curvature resulting from an observer at a mass is sometimes claimed to be observed at great distances from Earth. Examples are black holes and light bending due to curved space-time caused by a distant large mass like a galaxy.
In each case, the observer must be both where they are on Earth and simultaneously adjacent to that distant mass to get the correct curvature defined by relativity for a moving observer at that adjacent location in the universe. This combination is clearly impossible.

Cosmologists also propose the universe space-time is expanding. It is impossible to identify the context for this space-time within the real universe which must include a fixed point reference for its dimensions. This expansion is also not a real thing.

Expansion involves the claim the space-time reference frame is changing so the observer is measuring positions which can change due to the variable scaling in the observer's reference frame.

Excerpt:

The expansion of the universe is the increase of the distance between two distant parts of the universe with time. It is an intrinsic expansion whereby the scale of space itself changes. The universe does not expand "into" anything and does not require space to exist "outside" it. Technically, neither space nor objects in space move. Instead it is the metric governing the size and geometry of space-time itself that changes in scale.

To an observer it appears that space is expanding and all but the nearest galaxies are receding into the distance.

(Excerpt end)

Observation:
This expansion is the appearance to the moving observer, not real.
In this expansion theory, space-time has its dimensional scaling increasing.

With space-time being background independent this proposed expansion is difficult to grasp when the scope of space-time is extended from only an observer to cover the entire universe.

However, there are known problems with this expansion among physicists.

Excerpt from Wikipedia:

A much slower and gradual expansion of space continued until at around 9.8 billion years after the Big Bang it began to gradually expand more quickly, and is still doing so.

Metric expansion is a key feature of Big Bang cosmology, is modeled mathematically with the Friedmann-Lemaître-Robertson-Walker metric and is a generic property of the universe we inhabit. However, the model is valid only on large scales, because gravitational attraction binds matter together strongly enough that metric expansion cannot be observed at this time, on a smaller scale. As such, the only galaxies receding from one another as a result of metric expansion are those separated by cosmologically relevant scales larger than the length scales associated with the gravitational collapse that are possible in the age of the universe given the matter density and average expansion rate.

Physicists have postulated the existence of dark energy, appearing as a cosmological constant in the simplest gravitational models, as a way to explain the acceleration. According to the simplest extrapolation of the currently-favored cosmological model, the Lambda-CDM model, this acceleration becomes more dominant into the future. In June 2016, NASA and ESA scientists reported that the universe was found to be expanding faster than thought earlier.

While special relativity prohibits objects from moving faster than light with respect to a local reference frame where space-time can be treated as flat and unchanging, it does not apply to situations where spacetime curvature or evolution in time become important. These situations are described by general relativity, which allows the separation between two distant objects to increase faster than the speed of light, although the definition of "separation" is different from that used in an inertial frame. This can be seen when observing distant galaxies more than the Hubble radius away from us (approximately 14.7 billion light-years); these galaxies have a recession speed that is faster than the speed of light. Light that is emitted today from galaxies beyond the cosmological event horizon, about 16 billion light-years, will never reach us, although we can still see the light that these galaxies emitted in the past. Because of the high rate of expansion, it is also possible for a distance between two objects to be greater than the value calculated by multiplying the speed of light by the age of the universe. These details are a frequent source of confusion among amateurs and even professional physicists.

Due to the non-intuitive nature of the subject and what has been described by some as "careless" choices of wording, certain descriptions of the metric expansion of space and the misconceptions to which such descriptions can lead are an ongoing subject of discussion within education and communication of scientific concepts.

(Excerpt end)

Observation:

This document tries to explain some of the “non-intuitive nature of the subject.”

There is also no evidence for an event affecting the false expansion at 9.8 billion years ago.

Motion In Space-time

Some theoretical physicists repeat the saying, “Spacetime tells matter how to move; matter tells spacetime how to curve.”

This quote is credited to John Archibald Wheeler.

Excerpt from Wikipedia:

"John Archibald Wheeler was an American theoretical physicist largely responsible for reviving interest in general relativity in the United States after World War II."

(Excerpt end)

That task simply means he was presenting an “interesting'” version for the public, not one directly from Einstein, who never said that quote.

A coordinate system must be referenced to the physical space by the observer and only that observer selects their coordinate system.

Theoretical physicists can accept this laughable statement only by misunderstanding physics, relativity and a coordinate system.

One learns in a physics class about the important forces of gravity, electric, and magnetic, and the result of acceleration from a force on a mass. Objects move by the external forces acting on them.

Objects in the universe do not move using specific coordinates defined by an observer somewhere in the universe.

Excerpts from Wikipedia:

Postulates of special relativity
1. First postulate (principle of relativity)

The laws of physics take the same form in all inertial frames of reference.

General relativity generalizes special relativity and refines Newton's law of universal gravitation, providing a unified description of gravity as a geometric property of space and time, or space-time. In particular, the curvature of space-time is directly related to the energy and momentum of whatever matter and radiation are present. The relation is specified by the Einstein field equations, a system of partial differential equations.

(Excerpt end)

Observations:

Relativity is a background independent theory meaning it never uses physical coordinates. All its field equations are confined to the moving observer's reference frame. Relativity by its very design never affects any physical entity, only the special observer's reference frame whose dimensions can be curved in this mathematical exercise.

When cosmology tries to apply general relativity, the context for space-time is still confined to the special observer's reference frame. This reference frame uses no coordinates in physical space.

Nothing in the universe is a special observer with a non-inertial reference frame using commanded motion.
Nothing in the universe moves using a coordinate system.

Everything in the universe moves as a result of forces acting on it. A change in kinetic energy requires a transfer of energy,
A coordinate system is not a source of energy.

The bending of light by space-time has been proposed.
The propagation of the synchronized electric and magnetic fields is affected only by the medium, as defined by its diffraction index.
Light will never follow a path defined by a coordinate system.

The use of a coordinate system requires an intelligent observer to command a move described by a coordinate system. To suggest a planet or star will perform a commanded motion is simply foolish.

Some theoretical physicists appear detached from reality. That quote is an emphasis of a manipulated coordinate system lacking a connection to physical space. Space-time requires a person, an observer moving through a gravitational field, to use it as their reference frame.

We are here on Earth, not on every celestial object to command their motions.

Classical physics was grounded in physical space with an established time increment for precise measurements while obtaining valid evidence for experiments to test and verify a theory.

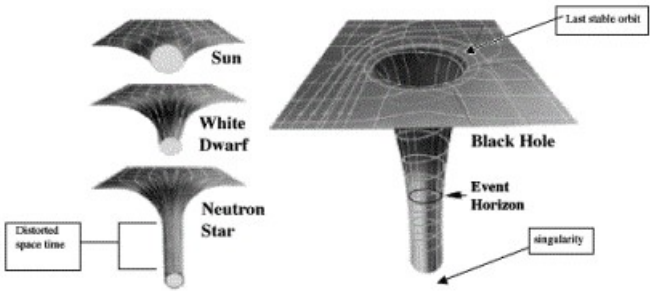
We can measure celestial bodies in motion using our selected coordinate system. They move as affected by external forces.
They do not move according to someone’s coordinate system.

Mankind has been observing the universe for a very long time without those bodies following a coordinate system.

Space-time In Graphics

Graphical representations of space-time curvature are an intentional deception.

This unedited image from NASA will help explain this deception.



In relativity, when the observer is moving near an object with a gravitational field their 4-dimensional coordinate system will be curved so straight lines in Euclidean geometry are no longer straight. If the user defines their motion using coordinates in the distorted dimensions then their path will not be straight.
This curvature affects the moving observer's coordinate system but no one else is affected.

Einstein's first postulate is "The laws of physics take the same form in all inertial frames of reference."

The left column in the image illustrates how the observer's space-time is curved when the observer is passing by the Sun, a white dwarf, or a neutron star.
For all other observers the Sun, the white dwarf, or the neutron star will be observed using classical physics, such as electromagnetic radiation.

The image is deceptive because there is no distinction between the observer moving past these objects and all other observers.

One could present an edited image to represent the view for all other observers by simply removing those curved graphics for the observer's space-time. At the lower left is the legend "distorted space time" explicitly noting the specific context for this graphic. That edited image removes the deception by showing the real universe, which all observers can observe and measure, and which is not affected by one observer's motion past a particular body in physical space.

The right column in the image has the most blatant deception.

The single arrow pointing to "Singularity" is actually pointing to 2 entities.

1) The physical mass at that location in physical space,

This mass is not shown here though each mass was shown in the left column.

The image could be edited as suggested to remove some of the graphics from the respective columns. Then the mass should be shown in the right column, consistent with the others, to help fix the deception for all observers other than the “special” one who is moving.

2) A point in the observer's reference frame or coordinate system.

The point is not in the image simply because a point has no size.

In basic geometry, the intersection of 2 lines is a point. The point is a specific coordinate in the coordinate system; a simple example of a point in 3-D is X1,Y2, Z3.

In the mathematical exercise of space-time curvature for an extreme mass all the lines of the respective dimensions cross at a point called the singularity.

This singularity is called a black hole though technically it is a black point. There is no hole in anything; it is just a point in a coordinate system.

The deceptive graphic hides this disaster for physics with two simultaneous conflicting entities where one entity is a concept, just a point in a coordinate system, while the other is a physical mass.

For all other observers the mass is present and can be observed and measured and as a mass it is still subject to the force of gravity from other bodies.

Physicists chose to combine these two conflicting entities, resulting in something physically impossible.

The singularity is claimed to retain the mass and its gravitational field. However, this point has no size so the result is a gravitational field coming from a mass having infinite density.

There should be another arrow in the image next to that of Singularity and pointing to the same point but with the legend "Impossible"

There is no such thing as a black hole. That will be explained later.

Probably, if graphical representations of space-time curvature were not deceptive then impossible entities like black holes would go away.

Also, the mistaken claim of remote gravitational lensing should also go away having no justification for a remote curvature.

To present the reality of a proposed black hole, the image for most observers (except for the special observer) who have no distorted space-time, the bottom right should have this note inserted using the Sun's graphic icon (instead of O):

Note:
Milky Way SMBH has O x 4.1 million visible to all other observers.

(End of note)

That simple change to the figure clearly unveils the deception because there is NO huge real mass of that size, observable by any observer other than the special observer, at that location claimed for that super massive black hole.

The black hole is something we are told is there but we cannot observe it. That restriction on visibility makes the concept immediately suspicious.

Tests To Confirm Space-time

The most famous test was the 1919 solar eclipse.
Sir Eddington observed a star during the eclipse, directly at the solar limb for the maximum diffraction through the bottom denser layer in the solar atmosphere.

Other observers noted other stars did not bend correctly.
Einstein's prediction expects a deflection proportional to the distance from the star, with the maximum at the limb. No stars other than the one on the limb were affected as expected.

This rigged experiment proves a changing medium of plasma, like in a star's atmosphere, can bend light.
Dr. Dowdye's experiments confirmed light bent as expected at different separations.
It did not confirm gravity bends light.

If it did, there should be distant stars appearing around every large star bending the light of the stars behind it.

For those wishing a thorough explanation, there is a roughly 10 minute YouTube video explaining how light propagating through plasma will bend at a predictable and confirmed angle.

The video is titled "Can Stars BEND LIGHT? General Relativity and Gravity with Dr. Edward Dowdye!"

Relativity has not been confirmed

For those wishing a thorough explanation, there is a web article roughly describing the lack of observational data confirming relativity. The problem is not disproving relativity. It must have its proof in evidence to be considered valid.
The article is titled “common misconception 9 — who disproved Einstein?”

This book contains several demonstrations of the validity of Newton’s force of gravity.

A contemporary test of relativity could have been performed using space-time curvature to predict the path of a space probe on a slingshot trajectory. Instead, NASA used Newton’s simple gravity equation and the complex path taken using precise timing was just as predicted. Whether NASA attempted a calculation using curvature is unknown, so whether relativity actually failed is unknown. Gravity was confirmed.
There remains no observation where relativity explained a motion when Newton’s force did not.

Gravitational Wave

Gravitational waves were supposedly predicted by Einstein.

When LIGO claimed their first detection of a gravitational wave in 2015, that event coincided with a perigee event. Every LIGO detection is near an earth tide event, or a full moon, new moon, perigee, and perihelion, when this celestial alignment causes a wave in the crust during the Earth's rotation.
In November 2019, this author predicted 3 distinct spans when there would be wave detections by LIGO. The predictions were based on the predictable earth tide events and the predictions were confirmed by LIGO reports. LIGO has never had one of its claims confirmed by an independent observation to verify anything about the claim.

The LIGO details are extensively described in the author's web site, cosmologyview, and are not necessary in this document.

LIGO is a farce and has never detected a gravitational wave.

Black Hole

A very large mass results in a very large curvature in the moving observer's space-time. With an extreme mass the curvature collapses to a single point in the space-time coordinate system.
The mass for this black hole's curvature is claimed to be so extreme that light cannot escape. The point is called a singularity to imply it exists in real space not just in space-time. The moving observer has their reference frame collapsed to a point. If the moving observer wishes to move in their reference frame by picking a coordinate, all coordinates are at that point in this curved coordinate system.

To all other observers the mass remains at that location in space.
This was described above in the section titled: Space-time In Graphics.

The combination of this mass leaves the visible universe for all other observers; now resides in a geometric point in the special observer’s space-time so no one else can see the mass;, and yet the point exerts the gravitational field of the mass within the point, at infinite density. This is incredible and is not physics.

This geometric point is given the misleading label of black hole. There is no hole because the geometric point has no size.

The most common use for a black hole is an X-ray source with no visible object.
Nearly every galaxy is assigned one but nearly all galactic cores are congested with dust, gas, and numerous stars so the source is usually obscured.
In this case, a black hole with an extremely hot accretion disk is proposed because with a gravity only cosmology plasma phenomenon are ignored,
There is one verified mechanism for generating X-rays: a synchrotron.

Excerpt from the European Synchrotron Radiation Facility site:
'
Synchrotron radiation was seen for the first time at General Electric in the United States in 1947 in a different type of particle accelerator (synchrotron). It was first considered a nuisance because it caused the particles to lose energy, but it was then recognised in the 1960s as light with exceptional properties that overcame the shortcomings of X-ray tubes.

In the mid- to late 1970s, scientists began to discuss ideas for using synchrotrons to produce extremely bright X-rays.

The entire world of synchrotron science depends on one physical phenomenon: When a moving electron changes direction, it emits energy. When the electron is moving fast enough, the emitted energy is at X-ray wavelength.

(Excerpt end)

Observation:

This simply defined mechanism for X-rays has been known for roughly 50 years.
Modern cosmology ignores this known physics and instead proposes a new mechanism never duplicated.

The mechanism is a black hole (an unverified theory) can cause a surrounding disk of material to heat to such an extreme temperature that its thermal radiation extends to X-ray wavelengths.
This mechanism has never been duplicated.

Excerpt from a post at the University Of Cambridge Institute Of Astronomy, about thermal emission:

To be hot enough for the peak of emission to be in the X-ray range the material would have a temperature of around 300,000-300,000,000K.

(Excerpt end)

This proposal is absolutely unbelievable for material in an accretion disk (not fully compressed but loose enough so only friction causes this heat) to reach this extreme temperature and remain intact.

In April 2020, an infamous image was taken of the black hole at the center of the M87 galaxy.

However, that donut-shaped object was a plasmoid, not a black hole. This torus of plasma generates synchrotron radiation extending to X-ray wavelengths.
Plasmoids were first observed in a laboratory by Winston Bostick in the 1950's when he coined its name.

A clear explanation of the M87 plasmoid is in a YouTube video titled "Wal Thornhill: Black Hole or Plasmoid? | Space News"

There is no evidence for a black hole. LIGO certainly never detected one.

Nearly every galaxy has an AGN bright in X-ray.
When the known plasmoid cannot be used in the gravity-only cosmology, a black hole is claimed to be there.

A cosmologist must assign a mass to this black hole. In practice, the mass is usually more than the number of stars assumed to be in that galaxy.

This is probably due to the barycenter expectation of a galaxy. With that basis, the mass at the center must balance all the mass around it.
No black hole in the universe had its mass actually measured. We are just told what is, in some number of solar masses, with no evidence for the claim.

One possible method is finding a black hole in a binary with a star. If the 2 move in an elliptical orbit around the barycenter then a mass could be calculated using the orbital parameters.

Astronomers keep looking for a star in orbit around the Milky Way black hole. This is nearly impossible. The simple rule with an ellipse is the period increases with the orbital radius.

Astronomers claimed to find a star with a period of 17 years but that period is in the range of our planets. That relatively small number of AU needed for that period cannot be resolved. As the radius approaches 1000 AU then the period is hundreds of years or more.

So far, each combination of a measured radius and period is not a valid ellipse.

Every black hole is assigned a value of a number of solar masses but with no evidence for the claim.

No black hole in the universe has had its claimed mass actually measured to verify the claim.

At the center of every galaxy is an X-ray source as either a plasmoid like in elliptical galaxies, Or another source of synchrotron radiation. A strong axial electrical current bending its path by a strong magnetic field. This combination is at the core of every spiral galaxy.

This axial electric current also generates the galactic magnetic field which causes the disk rotation (no fictitious dark matter).

Better coordinate system for our universe

We are told frequently we live in a 4-dimensional universe.

Unfortunately, the universe has no inherent dimensions and those 4 being offered by space-time are wrong for our recording our observations.

Here is a 4-dimensional system for observing our universe, and is better than space-time.

Some say space-time defines or describes our universe.

Some say space-time is our universe and was created with the big bang.
Space-time is a 4-dimensional coordinate system with 3 linear coordinates and 1 time coordinate.
It is easy to say this particular set of 4 dimensions have never been used for a celestial observation in the entire history of mankind.
The space-time dimensions are not practical when observing our universe.

A better approach was initially described over 2000 years ago, so it has been used a long time.

Excerpt from Wikipedia:

Hipparchus (c. 190 – c. 120 bc) was a Greek astronomer, geographer, and mathematician. He is considered the founder of trigonometry.

Hipparchus is credited with the invention or improvement of several astronomical instruments, which were used for a long time for naked-eye observations. According to Synesius of Ptolemais (4th century) he made the first astrolabion: this may have been an armillary sphere which Ptolemy however says he constructed; or the predecessor of the planar instrument called astrolabe. With an astrolabe Hipparchus was the first to be able to measure the geographical latitude and time by observing fixed stars.

Hipparchus also observed solar equinoxes, which may be done with an equatorial ring: its shadow falls on itself when the Sun is on the equator (i.e., in one of the equinoctial points on the ecliptic), but the shadow falls above or below the opposite side of the ring when the Sun is south or north of the equator. Ptolemy quotes a description by Hipparchus of an equatorial ring in Alexandria; he [also] describes two such instruments present in Alexandria in his own time.

Hipparchos laid the foundation for the celestial coordinate system still in use today, with its basis in his equatorial ring.
With the daily rotation of the Earth the universe is observed as a sphere by everyone so spherical coordinates are correct, not linear coordinates.

(Excerpt end)

All astronomers use the 2-dimensional celestial coordinate system, having 1) an angular value for right ascension (RA) based on an equatorial ring, and 2) an angular value for declination (Dec) which is the angular distance from the equator.

The better 4-dimensional system for cosmology to replace space-time:

1) the object's measured RA position,
2) the object's measured Declination position,
3) the distance to this object, obtained by other observations (such as parallax),
4) the time of this position measurement.

With this 4-D coordinate system, every object in the observable universe can have its current position described at the time of the observation. Any observer using Earth as the reference can duplicate this position measurement.
Time is included in the 4 because a time measurement is required to measure motion of an object by changes in its measured position over time.

Space-time is wrong for astronomy. It was defined for a very different purpose, as the reference frame of a moving observer in the theory of relativity.

Space-time is the moving observer's frame of reference.
The values in the 4 dimensions are used in the relativity equations as change-x, change-y, change-z, change-t.

Space-time is for only the moving or non-inertial observer and their dimensions can be curved by a gravitational field. Space-time does not apply to all the others observing the universe. Observations begin with the current measured positions. Changes come from calculations after multiple observations.

When astronomers consistently use the same 4- dimensional system while observing the universe, mistakes are avoided.

Space-time is just wrong for the universe.
Space-time is not real. Any n-dimensional coordinate system can never be real. It is only a framework used by an observer to measure physical positions.
Believing it to be real enables fictional concepts to arise, including black holes and the expanding fabric of space-time.

Replacing space-time with a better 4-D system will lead to a better cosmology, when it ignores an irrelevant special reference frame.

We should also stop getting fictional stories about a multi-dimensional universe.
The universe has no dimensions. The observer defines the coordinate system and its dimensions for their observations.

The simple 3-D Euclidean geometry is always a convenient system for local observations and measurements, like in a laboratory.
Space-time is not appropriate when observing the universe.

Observation:

The widely accepted 4-dimensional system for measuring positions around the Earth is the GPS system.

1) the object's measured longitude position,
2) the object's measured latitude position,
3) the elevation of the object,
4) the time of this position measurement; this item is not required, unless calculating a velocity.

Structured Atomic Model

There has been a standard model for an atom for a long time. The Large Hadron Collider has been used frequently to learn about the subatomic particles declared to be part of the Standard Model.

Excerpt from Wikipedia:

The current state of the classification of all elementary particles is explained by the Standard Model, which gained widespread acceptance in the mid-1970s after experimental confirmation of the existence of quarks. It describes the strong, weak,
and electromagnetic fundamental interactions, using mediating gauge bosons. The species of gauge bosons are eight gluons, W−, W+ and Z bosons, and the photon. The Standard Model also contains 24 fundamental fermions (12 particles and their associated anti-particles), which are the constituents of all matter.

(Excerpt end)

The Standard Model has “widespread acceptance.”

Recently, a new model for the atom has been proposed, the structured Atomic Model, or SAM. This model is considered, in this book, part of building a new cosmology because it could affect how cosmology deals with atomic behaviors.

A brief description is found by:
“Edwin Kaal: The Proton-Electron Atom — A Proposal for a Structured Atomic Model | EU2017”

Excerpt:

Importantly, this model does not contradict the evidence in chemistry and physics, but rather provides a new interpretation and a promisingly fresh approach. With this model, Edwin has been able to resolve enigmas in chemistry and make predictions to inform future research.

(Excerpt end)

That page offers a video of the presentation by Edwin Kaal with details about SAM.

Essentially, SAM proposes a structured atomic nucleus consisting of only protons and electrons. A neutron is the pairing of those two. Its well known that a neutron will decay into the proton-electron pair when outside of a nucleus for a few minutes.

Another outcome of SAM is the alpha particle decay. I is easier to explain this ejection when the particl already exists in the nucleus, rather than the bucleus having a random arrangement somehow assembling that particular combination of 4 particles before ejecting that specific set of 4, consistently.

SAM does not yet have substantial public details beyond the YouTube video. The model has been presented to other groups.

Conclusion

Relativity has no evidence for its claim that gravity moves at the velocity of light. There is conflicting evidence that proves relativity is wrong because protons are measured at a velocity at multiples of c. In all cases, space-time has no solid evidence to even suggest it could be a valid replacement for Newton's force of gravity. The experimental evidence (by predict and confirm) consistently confirms the force of gravity. Light bends by plasma in the solar atmosphere, not by gravity, not by space-time.

Space-time is not the correct 4-dimensional coordinate system for recording our observations of the universe.
We have been using the celestial coordinate system for a very long time.

Cosmology must have repeatable evidence with no conflicting evidence.

Relativity lacks convincing evidence to justify its claim it is better than Newton's force of gravity.
It claims that both the velocity of mass and the force of gravity are limited to the velocity of light are both falsified.

There is no justification for the continued use of space-time in cosmology.

One result of removing relativity from cosmology could be is a return to classical physics.

Physicists incorrectly assumed relativity's space-time was a valid replacement for the force of gravity.

It is not.

The widespread acceptance of relativity distorted physics, in several ways.
The crucial 4 wrong assumptions of relativity:

1) Time is an entity which can change from its inherent fixed increment behavior to a behavior which can vary for the moving observer.

2) Gravity had a velocity of propagation,

3) Mass had a velocity limit at the velocity of light,

4) Gravity was not a force but instead a field causing a distortion of the moving observer's reference frame.

Together, these 4 mistakes by relativity diverted physics from reality.

Time must maintain its fixed increment to be used by all observers for consistent measurements,

.

All 3 fundamental inverse-square forces are instantaneous.

Light is not an entity which can be affected by gravity or by the observer's reference frame. The Doppler Effect is always consistent, and conforms to the conservation of energy.

The work of Hannes Alfven on plasma physics improved the understanding of the electromagnetic forces and behaviors, but did not truly change them. Additional behaviors were defined. This was necessary because the newly observed plasma behaviors require their definitions.

Electrical engineering describes 3 fundamental entities: capacitor, inductor, and resistor. The capacitor and inductor can store electrical energy. The resistor describes how each can accumulate their energy and how each releases that energy.

Alfven observed those 3 entities can be observed in celestial behaviors.

When relativity used the gravitational field rather than its force, the science of particle physics was also distorted.

Forces became fields.

A unified field theory became the elusive goal. The 3 inverse-square forces were already consistent.

Quantum gravity is an attempt to resolve the conflict, with a possible imaginary particle called a graviton.

Light became an imaginary particle called a photon.

The Standard Model is an exercise in using the LHC to create subatomic particle fragments.

The Structured Atomic Model redefined the connection of the atom to chemistry. The Standard Model contributed nothing substantial, beyond data for only those interested in subatomic particles, a domain which affects almost no one.

The removal of relativity affects more than just cosmology.

By removing relativity, physics will improve.