

General Relativity For Teletubbies

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Geometry & Relativity

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It is clear that many are very confused as to what a "geometric" explanation is with regard to Relativity. That is, Special and General Relativity does not offer a "geometric" explanation for the physical consequences of Relativity in any way shape or form. It only gives an *account* of the physical observations, on the assumption of the physical facts.

Such claims abound, and are repeated endlessly from follower to follower, with no questioning as what that statement actually means. Hopefully, this article will clear up the situation.

Geometry is a branch of mathematics.

<https://en.wikipedia.org/wiki/Geometry>

Geometry does not contain any physical facts as of itself, however it may be used describe physical facts.

Geometry is based and defined on arithmetic and logic. Physical reality forms no part of geometry. It's an "all in the mind" endeavor, by definition.

For example, geometry, defines a triangle, purely mathematically. Whether or not a triangle physically exists in the universe is not relevant, or even if a straight line physically exists. Thus if one observes a physical object with the properties of a triangle, geometry cannot possible be an explanation for the triangle's existence itself or that it has those specific properties. Geometry can only *describe* the properties that such a discovered object has, when it is discovered, if it satisfies the axioms.

This is root of the misconception of the phrase "The geometry of Space-Time explains why clocks taken on round trips read different from the reference clock".

The word "geometry" has been hijacked then used in a manner that gives an incorrect meaning to the situation. There is a conflation of geometric properties with physical properties. Physical properties requires physical measurements, geometric properties do not.

Thus when a claim such as geometry does not explain a physical characteristic is made, it means, essentially, that the of all the possible mathematical (geometric) results that include the physical fact, there is no unique geometric way of saying which one of those general geometric results agree with that physical fact.

This can be summarised by:

If a physical measurement is required to determine a property, that property is not a geometric property (geometric fact), it is only a property that may be describable by geometry.

Without real objects, and rulers, geometry has no meaning in a real physical universe. Geometry is a virtual concept. Objects in the physical world have to exist that satisfy the axioms of geometry. That is not a-prior, a fact.

In the example of SR, the physical fact of an apparent invariant speed of light "c", is what selects out the LT from the GT. There is no geometric way to make this selection. It is thus the physical fact of apparent invariance of "c" that explains clock readings, not geometry.

Geometry has way too many *general* solutions to *explain* physics. It is equivalent to claiming that geometry says the answer will be between 0 and 1. The measurement discovers it is 0.04689254748, thus geometry has explained the physics.

The fact that there may be only two options such as infinite or c, does not refute the argument, notwithstanding that much has been written that the LT is inherent based on various assumptions.

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Website last modified 15th May 2020

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