

The Real Meaning of Special Relativity

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Einstein's Special Relativity (SR) is the biggest advance of the 20th century in theoretical physics. Let us say Einstein hit gold.

A. Einstein was a talented physicist, but his main talent was in how to hide the gold to prevent it from being stolen. He elaborately misrepresented the discovery so that even today nobody really understands its true meaning. And I mean it. Even the people on the top of the mainstream theoretical physics, who acquired an excellent mathematical background, do believe that SR is not a classical theory, that it uncovers a symmetry called “Lorentz invariance”, and to go forward one has to look for another possible symmetry/invariance in physics. No wonder that the opposition to mainstream with lower math background has no idea what SR is about.

SR comes from Maxwell's equations. It is not a “physical” theory and not a “mathematical” theory either. It is about how to describe a physical reality in theoretical physics correctly. The main result of SR is rewriting the Newton's Dynamics equation into the “Relativistic Dynamics equation”. After the “rules of correct representation” (it is actually SR) are established, all the so called “physical consequences of SR” are in fact the consequences of Maxwell's equations and Relativistic Dynamics equation. That confirms that SR is not a physical theory.

SR gives us a “rules of correct representation”. That means that any other representation can be correct only by chance (Maxwell's equations can be correctly written in 3d and 4d forms) and in general is incorrect. SR actually delivers us from making logical/mathematical mistakes (Newton wrote down the equation that works only at low velocities because he used incorrect math and did not know SR rules). In this capacity SR is definitely a classical theory.

Yes, SR is difficult to comprehend. To explain that, I need to make some statements.

Statement 1: Theoretical physics is a **numerical** description of physical reality.

Statement 2: Mathematics is a science about **mathematical objects** (in particular **numbers**).

It is important to notice that mathematical objects are constructed only from digits and letters of alphabet. Mathematics is a continuation of linguistics. Physical objects cannot serve as a math objects. It is an imperative that the mathematics that is used in theoretical physics should be separable and should be completely understood by a researcher.

The 3d physical geometry that is taught in schools said to be mathematics, but it is not. 3D physical geometry is theoretical physics of unmoving physical objects. It has inseparable mathematics and interrelated with blueprints and physical models that also are used as a means of description of physical reality. The separate mathematical apparatus can be provided but never taught.

To understand SR one has to study the separate mathematical apparatus of 3d geometry first. Actually the 3d numbers (and n-d numbers) have to be introduced (points, scalars, vectors, tensors).

One has to keep in mind that same words are used in mathematics and in theoretical physics where they have a different meaning. Actual SR puts an exact boundary between mathematics and physics. It looks completely different compare to Einstein's presentation. Both his postulates are the consequences – not the starting points.