

Relativity overview

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Physics students are taught Einstein's Theory of Special Relativity and told that gravity is explained by his Theory of General Relativity. It is widely thought that he developed the theory of (special) relativity himself. Einstein published his theory in 1905 in an obscure German Journal few read. Very few physicists took any notice of it until he published his General Theory of Relativity. In the mean time students studied the papers of Lorentz and Poincaré.

The theory of Lorentz and Poincaré is a classical theory of cause and effect derived from applying the laws of electromagnetism to the discovery that matter was composed of electric charges. They were based on the assumption that there is a background in which electric and magnetic fields exist and through which light has a constant speed. The various electromagnetic effects conspire to make it impossible to detect the earth's velocity through that background. Motion through the background causes matter to contract in the direction of motion, mass to increase and time dependant processes to slow. The theory describes the relationship between the processes which take place against the background and what we measure as moving observers in a set of equations known as the Lorentz transforms. Poincaré's contribution was to show that the transforms work between any two observers in relative motion to each other.

Einstein's theory derives Lorentz's equations from a philosophically very different understanding of the nature of reality. What were real physical effects become mere artefacts of observation resulting from the observer's velocity relative to that which is observed. Even magnetism is robed of its reality and reduced to an artefact of observation.

Einstein is such an icon of intellectual achievement that it is hard to criticise his work without attracting derision. At that risk, we take issue with his explanation and derivation of Lorentz's equations and Poincaré's discovery that they could be applied universally. We show that Einstein's mathematics is a fudge, and give a full derivation of the Lorentz Poincaré theory.

Einstein's explanations abandoned the philosophy of Newton and Descartes which form the basis of Classical Physics and ventured into the woods of existentialism placing emphasis on the observer and the observation. His plagiarism of these equations abandons any notions of a causal process, declares that God has deemed that the speed of light is a universal constant and then attempts to work backwards from there. Unfortunately, the speed of light is not a universal constant: only the locally measured speed of light is constant. This is because light is affected in exactly the same way as the rulers and clocks used to measure its speed! Einstein's interpretation denies the existence of a background and any physical effect which might result from motion through it. The effects of contraction in length, slowing of clocks and increase in mass become mere artefacts of observation.

It is mathematically impossible to work backwards from the assumption of a universal speed of light to the Lorentz Transforms, length contraction, increase in mass and slowing of clocks. Einstein had to wheedle the odd $(c + v)$ and $(c - v)$ into his equations to fudge his results. Those few intelligent enough to spot the fudge find themselves ridiculed by the majority who disguise their own lack of understanding with hero worship of Einstein. Einstein's fudge is to secretly give light the property of "ownership" and then let one observer use light owned by the other observer to synchronise his clocks. This allows him to arbitrarily give one inertial frame the properties of Lorentz's stationary system and the other the properties of Lorentz's moving system.

In the real universe, there is a background. Motion of electric D flux through it generates magnetic intensity H, while motion of magnetic B flux generates electric intensity E. These two actions of nature combine to create the feedback process which makes it possible for radio waves and light photons to exist. The same

feedback process acts on the electric and magnetic fields of matter and causes two real physical effects; the contraction in length and the increase in mass. As a result of these, all time dependent processes are slowed. The contraction in length and slowing of clocks affects the synchronisation of clocks resulting in the validity of the Lorentz transforms.

The concepts of Euclidean space and Newtonian time are not affected. It is against them that we measure the real effects of the length contraction and the slowing of clocks.

We cannot separate Lorentz-Poincaré relativity from Lorentz's theory of electromagnetic mass. The derivation of the mass increase comes from applying the contraction in length to the electromagnetic mass theory. They are part of a unified theory. Einstein's theory has no electromagnetic mass because it does not admit to the reality of magnetic fields!

The effects on rulers and clocks are reciprocal. Each observer sees the other's ruler contracted and his clocks to run slow. In Einstein's theory, this emerges as a paradox and the student is invited to show his extreme intelligence by understanding the paradox. In the full Lorentz Poincaré theory, there is no paradox. The effects are real and are due to motion through the background. The effects on clock synchronisation lead to the symmetrical observations between two observers each moving through the background, but the mathematics of this derivation is difficult and beyond the average physics student. Einstein's derivations of the Lorentz transforms are much easier to teach.

Both the relativity of Lorentz and Poincaré and Lorentz's theory of electromagnetic mass require a background, yet no satisfactory theory of the aether was ever found. We make the assumption that space is empty except for electric and magnetic fields which exist in their own right. We suggest that the coexisting electric fields of all elementary charged particles forms a background, the effective velocity of which is an average velocity weighted by electric potential. This would give the background the property of moving, and to some extent rotating, with the galactic mass. One of the consequences of the rotation would be a reduced centrifugal force on the stars of the spiral arms.

Our unified theory corrects a number of faults in the original Lorentz Poincaré theory relating to the energy content of the electric field of an electron and the increase in mass. The Lorentz transforms and their application remain the same, but we describe the increase in mass in a much more satisfactory way making it possible to explain why atomic and mechanical clocks run slow. Einstein's clocks run normally, it is just that time runs slow, no causal explanation is needed, but our unified theory needs to explain everything as a causal process and these modifications put the theory on a more rigorous mathematical basis.

Einstein's General Theory of Relativity is a theory of gravity which attempts to unify the forces of gravity and electromagnetism through the Equivalence Principle which links gravity and acceleration. In 1911, Einstein published this in a paper in which he went on to predict that light is bent by gravity. In a further paper in 1916, he doubled the bending. When his second prediction was confirmed by Eddington's observation of the stars during an eclipse of the sun, Einstein's theories began to be taken seriously.

The Equivalence Principle is contrary to Lorentz's theory of electromagnetic mass which asserts that matter possesses inertial mass because kinetic energy is stored in the magnetic fields generated by the motion of the elementary charged particles from which it is built. Acceleration of an object in the direction of motion through the background increases the kinetic energy stored in these magnetic fields requiring work to be done. Deceleration involves the object doing work against a resisting force. Centripetal acceleration of an elementary charged particle does no work but changes in the direction of motion require movement of energy within these magnetic fields generating centrifugal force. On the other hand, maintaining the position of an object in a gravitational field involves no change in kinetic energy. The different types of acceleration and gravity all have different physical effects and are not equivalent.

In the imaginary world of Einstein, I feel my weight pressing against my chair because I am not travelling in a straight line through four dimensional space-time, but moving in such a way that although I do not seem to be getting anywhere, I am in fact being accelerated upwards at 9.81 ms^{-2} .

There is an alternative explanation for the force of gravity. The first key to understanding gravity is to accept the fact that the electric fields of all elementary charged particles coexist in space as evidenced by the existence of magnetic fields. The second is understanding that gravity is not associated with the forces electric fields exert on electric charges, but with the energy contained in the electric fields of the charges. When electric fields coexist in the same space, they have a very very small effect on each other reducing the amount of energy they contain. As a ball falls to earth, it encounters an increasing density of coexisting electric fields and energy is liberated from (or perhaps squeezed out of) the electric fields of its constituent elementary charged particles to provide the increased kinetic energy and do work against any resisting force. We infer a force of gravity is at work.

Gravity takes energy away. Einstein's theory makes a further mistake by not understanding the nature of the take-away thinking it to be subtraction. There are two two types of taking away. Subtraction giving: 10, 9, 8, 7, 6, 5..... and fractional giving: 10, 9, 8.1, 7.29, 6.561, 5.9049. The energy released by gravity is released fractionally. The removal of a small fraction applied a very large number of times is described by the mathematics of exponential decay. Einstein's theory reaches a point where everything that could be subtracted has gone. At that point, it predicts a singularity. In the real universe, we can never run out of energy. Real black holes do not contain singularities.

The action of gravity draining energy from electric and magnetic flux affects the two constants; permittivity ϵ_0 of electric fields and permeability μ_0 of magnetic fields. These constants determine a lot of things in nature from the speed of light to the equilibrium distance between atoms. We can easily analyse these effects with the use of Dimensional analysis to produce a complete theory.