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A Review on Theory of Relativity

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ABSTRACT: In this paper we are going to take a review on Einstein's theory of relativity. The theory of relativity of relativity is gives the relation between energy and mass. The theory of relativity is divided into two parts. One is special theory of relativity and another is general theory of relativity. The theory relates to speed, time, and mass mainly.

Albert Einstein special theory of relativity is proposed in 1906. Where, the general theory of relativity is proposed in 1916. The special theory of relativity is based on mainly concept of speed of light where, general theory of relativity is based on gravity and curvature in space time.

I. INTRODUCTION

Upto 19th century it was believed that the Newton's laws of motion and ideas are basis on which motion of matter can be understood. But after introduction of Maxwell theory of electromagnetism, it could not satisfy the Newton's laws of motion come in doubt.

After this Albert Einstein introduced his two theories one is special theory of relativity and another is general theory of relativity. These two theories are the experimental and physical results. These theories are in the description of space, time, matter, and energy which can be understood.

II. LITERATURE REVIEW

This principle of relativity was accepted (in somewhat simpler form i.e. with respect to the mechanical behavior of bodies) by Newton and his successors, even though Newton postulated that underlying it all was 'absolute space' which defined the state of absolute rest. He introduced the notion in order to cope with the difficulty of specifying with respect to what an accelerated object is being accelerated. To see what is being implied here, imagine space completely empty of all matter except for two masses joined by a spring. Now suppose that the arrangement is rotated, that is, they undergo acceleration. Naively, in accordance with our experience, we would expect that the masses would pull apart. But why should they? How do the masses 'know' that they are being rotated? There are no 'signposts' in an otherwise empty universe that would indicate that rotation is taking place. By proposing that there existed an absolute space, Newton was able to claim that the masses are being accelerated with respect to this absolute space, and hence that they would separate in the way expected for masses in circular motion. But this was a supposition made more for the convenience it offered in putting together his Laws of motion, than anything else. It was an assumption that could not be substantiated, as Newton was well aware – he certainly felt misgivings about the concept! Other scientists were more accepting of the idea, however, with Maxwell's theory of electromagnetism for a time seeming to provide some sort of confirmation of the concept. Around 1907, Minkowski's scientific reputation rested largely upon his contribution to number theory.³ Yet Minkowski was also the author of an article on capillarity (1906) in the authoritative *Encyklopadie der mathematischen Wissenschaften*, granting him a credential in the domain of mechanics and mathematical physics. In addition, Minkowski had lectured on capillarity, potential theory, and analytical mechanics, along with mathematical subjects such as Analysis Situs and number theory at Zurich Polytechnic, where Einstein, Marcel Grossmann and Walter Ritz counted among his students; he also lectured on mechanics and electrodynamics (among other subjects) in Gottingen, where he held the third chair in mathematics, created for him at David Hilbert's request in 1902.⁴ In Gottingen, Minkowski took an interest in a subject strongly associated with the work of many of his new colleagues: electron theory. An early manifestation of this interest was Minkowski's co-direction of a seminar on the subject with his friend Hilbert, plus Gustav Herglotz and Emil Wiechert, which met during the summer semester of 1905.⁵ While Lorentz's 1904 paper (with a form of the transformations now bearing his name) was not on the syllabus, and Einstein's 1905 paper



had not yet appeared, one of the students later recalled that Minkowski had hinted that he was engaged with the Lorentz transformations.

III. DESCRIPTIONS

The theory of relativity is connected with space and time. The theory includes the energy equation $E=mc^2$. He proved that all the matter in the universe follow this equation. No any matter can violets this equation who has some mass in space and time. The speed of light i.e. $c=3 \times 10^8$ m/s is the speed limit of this universe. No body having some mass in space time can travel with this speed. To travel at this speed it needs to become massless.

Only photons of light can travel with this speed. The light is made of discrete packets of energy which is called as photons, and light is made of photos and hence no any body having mass can travel at this speed.

According to Einstein the bodies having some mass makes a curvature in space-time. As the mass increases the curve in the space time increases. Black holes in space makes the biggest curvature in space-time. The concept of bending of time arises from this statement.

IV. TIME BENDING

The concept of time bending is proposed by Albert Einstein in his theory of relativity. The concept is that, at the edge of space-time curve where curve is large the time experiences the bending. It's not an actual bending but it seems to be a bending. Light and time travels at same speed, but at the curvature in space-time the light goes at its speed and covers the same distance but time becomes slow at that point this is called time bending.

V. FRAMES OF REFERENCE

The frame of reference is related between two bodies. Consider there are two bodies A and B. Firstly A is stationary and B is in motion with reference to A. Here A will experience that B is in motion and B will experience that A is at rest and vice versa.

In 2nd condition both are in motion but A is faster than B then B will experience that A is faster than Band vice versa. Both the bodies are in motion of rest or motion with respect to each other and hence both the bodies are in frame of references with each other.

VI. CONCLUSION

From the above review paper, we have studied the theory of relativity suggested by Albert Einstein which proposes that the speed of light is the maximum speed limit for an object having mass in the universe.

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