

Four Fundamental forces or Three Fundamental forces

**-Project by
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Introduction:

There are Four Fundamental forces of nature which includes the strong force, weak force, Electromagnetic force and the gravitational force.

But this came to question when Einstein published his papers of general relativity 1916, he mentioned that gravity that it's the

**bending/warping of space
time in the presence of matter.**

**Many scientists interpret
gravity as a “pseudo force”.
Since it is not exactly the force
of attraction between two
bodies as Sir Newton
theorized.**

AIM:

Our aim is to arrive at a decision of whether gravity belongs to the Fundamental forces or should be excluded from the list.

How are we going to arrive at that conclusion? :

We are going to subject phenomenon happening all

around the universe to the fact that gravity isn't a force (according to Einstein) and look at the possible results derived from the above given statement to see whether gravity is indeed a fundamental force or not.

1.Black Holes:

Black holes are a great subject of interest for this problem, since the existence

of black holes was confirmed by General relativity!

Black holes are caused by the deaths of stars which are more than 2 to 3 solar masses.

Blackholes have the point called “The singularity”, a point inside the black hole which is infinitely dense that even light can't escape it!

But the space time is inverted inside these black holes! , They are so dense that Time freezes but space is in

constant movement. However General theory of relativity cannot explain the gravity inside the black hole which points to the fact that Einstein was right but there will be theories which surpass the theory of relativity which would give a clear-cut explanation. This also points to the fact of General relativity being Incomplete with the additional factor of Quantum Mechanics coming into action.

2.Radiation of charged particles in a gravitational field paradox:

This is the paradox formed due to the works of Einstein and James Clark Maxwell.

Maxwell's electromagnetic theory states that Charged particles if accelerated will release electromagnetic radiation as accelerating particles propagate as in electric and magnetic fields!

So how does this even come into general theory of relativity? Einstein described that all stationary bodies are constantly Accelerating in a gravitational field due to the change in space time. And when put 2 and 2 together we get into the thought of why do the stationary charges in the earth then radiate electromagnetic radiation?

This question came into light of the American theoretical physicist Fritz Rohrlich who came up with a solution to this paradox

He stated that we have to remember that the maxwell's theory is only applicable in the inertial frame of reference. Inertial frame of reference is a state where the body is not experiencing acceleration and all the laws of physics apply and also the net local force acting on the body is zero. According to our frame of reference, we are not in a frame of reference in which maxwell's theory of electromagnetism works, hence it doesn't radiate. For a freely falling body however, that body

experiences and sees the radiation

And that radiation is inaccessible to the normal stationary object , which suggests the uniformly accelerated object has an event horizon in which there are activities in which actions are observable and non-observable to the observer. Kind of absurd to even think about that!

Conclusion:

So, what can we conclude from this? We can say with certainty that there are instances which support the existence of gravity as a force and instances which

Doesn't, and hence this complex discussion is having an open ending of whether gravity is a force or not a force. But personally, with the tests and researches we have conducted, we believe that gravity is indeed not a force but theories may come confirming the existence of gravity as a force!

Thank you!