



A model for a multi-dimensional space that encompasses Newtonian as well as Quantum physics.

Physics

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ABSTRACT

Our reality consists of four dimensions: space and time. In our four dimensional space what we observe can be explained by Newtonian physics, however, when trying to explain what is observed at the level of particles and their sub-components, one has to invoke quantum physics and string theory with up to 11 dimensions. So how do these theories fit together? One possibility is that the four dimensions that we live in are special in that they are surrounded by what could be compared to a Faraday cage; the characteristics of the cage are such that forces like gravity and the electromagnetic force cannot enter, while the strong and the weak forces that hold the particle together are able to pass through and therefore spread both in space/time and in the additional dimensions.

KEYWORDS:

Faraday showed that if you have a cage of electrically conducting material, then electromagnetic fields are not able to enter the enclosed space. Importantly, a Faraday cage can be made of a conducting net, where the mask's size determines the wavelengths that are kept from entering. Electromagnetic waves with wavelengths smaller than the masks' size will pass through unhindered by the cage, while those with longer wavelengths are unable to penetrate the cage. Imagine for a moment that the four dimensions of space and time are special, and that they are surrounded by what could be compared to a Faraday cage. Also, imagine that the four forces; gravity, electromagnetic, the strong force and the weak force have a characteristic that can be compared to wavelengths. Here it is important to note that waves formed by the four forces follow a decreasing pattern with regard to their wavelengths as follows:

Gravitational waves are 10^{-27} to 10^{-5} metres in length.

Electro-magnetic waves are 10^{-2} to 10^{-12} metres in length.

Strong force wave maximum is 10^{-13} metres in length.

Weak Force wave maximum is 10^{-15} metres in length.

Similarly, the proposed wavelength-like force characteristics could be decreasing in size in a similar manner. The proposal is that the "Faraday cage" is such that the electromagnetic and gravitation forces cannot enter the cage to the other dimensions and will, therefore, decrease in force with the square of the distance in the three dimensions of space that encompasses our reality. However, the other forces, the strong and weak nuclear forces, are able to pass through the cage into three dimensions we know, as well as, into the other dimensions, and will therefore decrease in intensity with distance accordingly at a higher order. This will explain why the strong and the weak forces only act much shorter distances, and decrease in intensity much faster than the square of the distance in our three space dimensions.

Now assume that we are not "inside" this Faraday's cage but on the outside, and that there is not one cage but as many "cages" as there are particles in the Universe. Most of these cages are independent, however, some could be interlinked as observed for entangled particles. Entangled particles share information. Entanglement can, for example, be observed when a photon is split into two when passing a certain type of crystal at a certain angle. The two photons will always share polarisations, and if the polarisation is not set, then when it is set for one it will also be set for the other. In this model, when the photon is split, they will share their "Faraday cage", connected in the other dimensions, allowing information and characteristic to be identical even if the photons are at different ends of the universe. Importantly, entanglement ceases when one of the photons or particles interacts with another unrelated photon/particle.

This model might also possibly explain inconsistencies at larger scales; while the gravitational force might not be able to enter the other dimensions on our scale, the force might be able to seep into the dimensions on the scale of the universe. Thus, such loss of gravitational force could potentially, at least in part, explain the higher than expected rate of our Universe's expansion.

Although this model is very simple, it could act to unify the different physical models as we know as Newtonian and quantum physics. Importantly, the described "cages" most likely merely reflect how matter, energy and forces interact and are not physical entities.