Dimensions

In order to understand the nature of the universe it is of primary importance to understand the framework of the universe. This understanding of the framework of the universe starts with the nature of dimensions.

In the spatial domain it is observed that there are an unlimited number of directions. It is also seen that there is no preferential direction. Once a direction is chosen, however, there are preferential directions with respect to the chosen direction. The preferential directions are those that are perpendicular to a chosen direction. It is only possible to have two directions that are perpendicular to any other direction in the spatial dimension. Any three perpendicular directions can be considered a dimensional frame. This allows for an unlimited number of dimensions of arbitrary directions.

Three dimensional space.

Directions that are perpendicular to the chosen direction have important physical relationships. There can only be three spatial directions that are perpendicular to each other and each of the three perpendicular directions are considered a spatial dimension. The three spatial dimensions may be referred to as X, Y, and Z. Although there are three spatial dimensions it is only possible to move in one direction at a time. Objects equal to or larger then Plank size or mass are limited to a velocity equal to the speed of light. Just as there are an unlimited number of spatial directions there is also an unlimited number of three dimensional frames.

Independence of dimensions and perpendicular directions.

A force applied in the direction of one spatial dimensional direction will have no resultant action on or in the other perpendicular directions of the other two spatial directions. This isolation from and between spatial dimensions illustrates the independence characteristic of all dimensional directions.

The lack of total independence in the spatial dimension.

Objects in the spatial dimension are only able to move in one spatial direction at a time and are limited to a total vector velocity equal to the speed of light. To be a true independent dimension objects should be able to move in all dimensional directions at the same time and the velocity limit would be equal to the speed of light in each direction at the same time. Action in the spatial dimensions may therefore be seen as limited independent dimensions.

Spatial directions are Isotropic, that is the same in all directions . When a force is applied to a mass object, the mass object will move with the same velocity irregardless of the direction. When a force is applied to a mass object it can move in only one direction. The sum of force applied over time can only result in movement in one direction. Likewise a force applied in one direction can have no affect on any other spatial direction that is perpendicular to the applied force. As stated before spatial directions that are perpendicular to any other spatial direction are considered a spatial dimension.