GRAVITY AND THE EXPANDING UNIVERSE

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If someone really believes in the expansion of the universe, it is relatively easy to explain what gravity is. Unfortunately, it does require new paradigms. But if they do not readily accept this then Science must do the unthinkable act of rejecting the expansion theory. The rationale is as follows:

First: Fundamental concepts: The physical universe is somehow composed of energy, and Nature works with "mini-max" (a bounded spectrum where the minimum and maximum values are the most probable per Ockham's Razor) principles. Additionally Space, whatever its composition, appears to be that substance separating and containing the components of the physical universe. The amount of energy expended in continually regenerating the entire universe would be the application of the maxima principle. It is more likely that in this matter, Nature uses the mini-max principle to mean that physical objects and space are continuous in time.

Second: Given the continuity of objects in time, we realize that said objects somehow 'exist' in the past, present, and future, whatever those are.

Third: Unlike science fiction, it is most unlikely that we can travel back and forth between the past and the future without traveling through the present. Whatever time is, it appears to be a one-way street (the arrow of time) used to measure the passage of events.

Fourth: Given the above, the universe must be composed of 'structured strands' of energy that penetrate through the present. It must also be pointed out that simple 'holes' in the present would allow energy to 'leak through' but could not provide for the observed structural uniformity such as all electrons having the same mass and charge. What we recognize as the physical universe, as opposed to the total universe (the cosmos?), is that aspect within the present. In some respects this is similar to Plato's concept of shadows on a wall.

Fifth: Since the present is always between the past and future, the present must be unbounded in all other directions. This gives us two alternatives: either the present extends indefinitely or it is a closed shell. Again by mini-max, it is most likely closed, forming some type of spheroid in hyperspace (a higher dimension than that of the known physical universe).

Sixth: Either the energy strands penetrating the shell are affixed to the shell or they are traveling through the shell. Since we believe that the events observed in the physical universe are formed by or accompanied by the expenditure of energy, it is most likely that the energy strands penetrate through the shell.

Seventh: This leaves us with two alternatives: energy is constantly accumulating within the shell or it is leaving. If it is leaving, the amount of energy within is being depleted and the activity we recognize as electrons, protons, etc., would be slowing down. The accumulation of energy is more likely, particularly in light of the next step.

Eighth: We have three alternatives with respect to the shell. Either it is fixed in size, contracting, or expanding. Since the shell is 'the present', meaning the entire physical universe, we believe that the shell is expanding in accordance with our initial belief in the expanding universe. This indicates that the strands may be fixed with respect to the hyperspace, with the shell expanding past the strands. It also indicates that the shell is simply a region of activity where the energy of the strands is 'released' thereby producing the observables of the universe.

Ninth: As the shell expands into some hyperspace, that hyperspace becomes available as 'our space' containing our observable universe.

Tenth: Since the energy strands are continuous in time, their number does not (in general) change. This means we face two alternatives: are the strands fixed with respect to the shell or with respect to each other? In view of the tremendous range of distances involved, it seems likely that strands that are close to each other (say within a given solar system or even a given galaxy) form a unit
while those far apart appear to be 'fixed' to the shell.

**Eleventh:** Since Space is physically generated to contain the expanding universe, this 'incoming' Space would be seen as fairly uniformly distributed. This means that the 'growth' of Space would seem to be a flowing of Space from around each strand composing a local system.

**Twelfth:** A metric measure (yardstick, meter, etc.) based on the fixed local system would show that the strands are 'held together' but the space around them is increasing. Observation of the flowing of Space around the strands would give rise to the concept of gravity. Viewed in the old system, gravity would be the force that accelerates various bodies toward each other so that they do not fly apart. Conversely this system recognizes that the local strands are somehow 'tied together' in the hyperspace outside the shell while Space flows from outside into the interior of the shell that is the present, and then into the Space contained by the shell.

Apparently the so-called gravitational force is not within our observable universe but is due to effects in hyperspace. By extension, the same holds true for the atomic and nuclear forces. This leads to the grandest paradigm of all, the Transform. From the eighth step, the shell is simply a region of activity wherein the potential energy of the strands (strings?) is released. Such a region of activity could be viewed as an activity wave propagating outward in hyperspace. Since this essentially two-dimensional wave in hyperspace forms our physical universe, we observe it in our space as three-dimensional. A more extensive evaluation shows that a transformation from one to three dimensions is required to move from hyperspace into our universe.