Dark Energy and Dark Matter are Negative Intrinsic Energy Bosons Formed when E8 was an Unbroken Symmetry prior to the Big Bang

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Abstract: In the epoch prior to the big bang E8 was an unbroken symmetry (see viXra 1405.0210) and both positive and negative intrinsic energy (mc^2) boson particles could be formed and also combined with positive intrinsic energy hadrons and leptons to form zero intrinsic energy fermibosonic entities which could carry matter from the previous universe without violating flatness requirements. Two such negative intrinsic energy bosons are a spin 0 particle and a spin1 particle, known to us as dark energy and dark matter respectively. The positive intrinsic energy forms of these particles also exist as the Higgs and the Zo particles. The negative intrinsic energy entity cannot form in our epoch with E8 symmetry broken to E8 x U(1).

The symmetry E8 is the highest known (see fn 1)) and is characterized as a Lie Group having only a single member with 248 representations. Its symmetry is so high that every gauge boson within its control appears in two forms, one particle form with positive intrinsic energy (mc^2) and one particle form with negative intrinsic energy (see fn 2). The negative energy particle form is unobservable to us directly because in our epoch E8 symmetry was broken by electromagnetism to E8 x U(1) by the big bang and unbroken E8 symmetry is necessary for the negative intrinsic energy particles to be produced and observed. There is nothing to prevent the particles from being detected indirectly, however, given sufficient ingenuity. In fact negative intrinsic energy matter has been detected in our universe as dark energy (a spin 0 boson form) and as dark matter (a spin 1 boson form). These two forms enabled hadrons and leptons of ordinary matter to be converted from the previous universe to our present universe without violating flatness. This was accomplished via two non-quantum fermibosonic entities of unbroken E8 symmetry.

The first form of fermibosonic entity to enter our universe was composed of equal amounts of ordinary matter (positive intrinsic energy) and spin 1 dark matter (negative intrinsic energy). The heat of the big bang decomposed the fermibosonic entity to form hot clouds of dark matter and huge black holes of ordinary matter. These may have been seen; the hot dark matter in the form of early, small, compact galaxies (see fn 3). Later in the history of the universe a second form of spin 0 negative intrinsic energy fermiboson appeared: these were torn apart over a long period of time by the gravitational field gradients of the huge black holes formed earlier to form spiral galaxies of ordinary matter and cool clouds of spin 0 dark energy. The ordinary matter was made up of more than 1/2 matter and less than 1/2 antimatter: the antimatter annihilated completely in the galaxy bulge region and none of the electromagnetic radiation from the annihilation ever reached greater distances where it could be harmful to life. This explains the missing antimatter problem (see fn 4). Also, the dark energy bosons contained no antimatter to start with and the modest preponderance of matter over antimatter insured that no antimatter would eventually remain.

The two forms of fermibosonic entity were forged by two new attractive forces and associated gauge bosons that were produced in the epoch before the big bang. In addition, another new attractive force associated gauge boson was activated in this epoch also to produce a universe-wide annihilation event between already-existing W+ and W- particles which we call the big bang and this was activated by the electromagnetic breaking of the E8 perfect symmetry then existing before the big bang.

The 3 new gauge bosons thus join the 5 already known (photon, W+, W-, Zo, and graviton) to form a representation number of 8, an indication that SU(3) symmetry is at work here, as also for life itself and the strong force (this last allowing atoms of many types, leading to complex chemistry). Eight is also the number of stable fundamental particles and their antiparticles produced initially in our universe. The next step up in representation number after 8 is 248 for E8 symmetry and this has been found to be the total number of different quantum particles, both stable and unstable, found to date (see fn 5).

In some epoch in the future our universe will become so cold. dark, and large that life will end everywhere and will need to be rejuvenated. This can be done by restoring conditions for life, and this will require an epoch of unbroken E8 symmetry again, to shrink and re-energize the universe and to cleanse its matter by reducing its metallicity. These actions will reset the size and entropy of the universe as a system to an original low value. The size of the universe will rapidly reduce because of the three attractive new forces under now unbroken E8 symmetry, and the entropy will be reduced because the hadronic complexity is reduced. The resulting steady-state cyclic action of the universe (in size, in conditions for life, in entropy etc.) has many features (see fn 6).

1. A. Garrett Lisi and James Owen Weatherall, “A Geometric Theory of Everything”, pp. 54-61, Scientific American, Dec. (2010)

2. Dan Hooper, “Dark Cosmos”, p. 91, Collins, (2006)

3. Michael D. Lemonick, “The First Starlight“, pp. 40-45, Scientific American, April (2014)

4. Helen R. Quinn and Yossi Nir, “The Mystery of the Missing Antimatter”, Princeton University Press, (2008)

5. A. Garrett Lisi, “An Exceptionally Simple Theory of Everything”, Wikipedia, (2007)

6. Roger Penrose, “Cycles of Time”, Alfred A. Knopf (2011)