

WEAK FORCE IVBs, NEUTRINOS, AND INFORMATION

(IVBs = "Intermediate Vector Bosons": the strange, massive field vectors (force carriers) of the weak force)

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[home page \(page 1\)](#)

[home page \(page 2\)](#)

[E-Book](#)

In the domain of the weak force, we find two types of elementary particles: 1) the (relatively) massive electrically charged leptons (electron, muon, tau); 2) their associated "identity charges", the (relatively) massless and electrically neutral neutrinos. Neutrinos are the "bare" identity charges of their massive leptonic namesakes, one for each type of massive lepton (the electron, muon, or tau neutrino). Although the three types of neutrinos resonate from one identity to another while in flight (apparently because their only distinguishing characteristic is a slight (?) difference in mass), they will only interact with their own specific massive and charged namesakes, during transformations or the creation/destruction of [single leptonic elementary particles](#). Neutrino "identity charges" (the characteristic charge of the weak force) provide the foundation for the information content of the Cosmos - just as the [weak force asymmetry](#) provides the matter surplus of the Cosmos. Resonance phenomena between the three neutrino types (see the magazine *Nature*, June 5, 2012) suggests not only that there is not much to distinguish them from each other, but also that they are indeed one of the [symmetry groups of light](#) - perhaps the most fundamental of the lot.

[We have already noted](#) the strange fact that the "W" IVB, which weighs the equivalent of about 80 proton masses, is required to regulate the creation, transformation, or destruction of *single* charged leptons, even though an electron is lighter than a proton by a factor of about 1800. [We have explained](#) this enormous "overkill" of available energy as due to the necessity to return to the original environment in which electrons were created, in order to ensure that every electron ever made - past, present, or future - is absolutely identical (for reasons of energy and symmetry conservation - for example, they must always be able to annihilate with an exact antimatter counterpart, or replace one another seamlessly in any interaction).

With respect to the neutrinos, whose mass is still unknown but may be as little as one-millionth that of an electron, we find an even more extreme mismatch between the "Z" neutral IVB and the particles whose transformations it regulates: the "Z" neutral IVB weighs about 90 proton masses. As in the case of the "W" IVB, we explain the huge mass of the "Z" as necessary to recreate the original energy environment in which neutrinos were created, and for the same reason: within type, every neutrino ever created - past, present, and future - must be exactly alike. If this hypothesis is correct, it suggests that the neutrinos were created before the massive leptons, in an earlier, smaller, and hotter universe, closer in time to the actual origin of everything - perhaps even before charged particles existed. In the modern universe, the "Z" can also mediate other weak force interactions, not involving neutrinos, providing there is no change in electric charge. [In a related interpretation](#), the "Z" is more massive than the "W" because it mediates a greater diversity and range of interactions than the "W" - in fact, any electrically neutral interaction among the quarks, leptons, and neutrinos that might threaten the integrity and conservation of identity charge. Because the Higgs boson is heavier still than the "Z", this must mean (following the foregoing interpretation), that the Higgs precedes the IVBs in time, lying closer to the "Big Bang" in a hotter, denser, and smaller Cosmos. The Higgs marks the threshold of the Electroweak unified energy domain, and in this respect, determines the masses of the weak force IVS. The IVBs in turn, determine the masses of the elementary leptons and quarks. It seems likely that several heavier versions of the Higgs exist, delimiting still earlier eras of the Cosmos in which leptoquarks,

quarks, and matter-only protons are created. See: [Table of the Higgs Cascade](#)").

The sense of this chronology is that the identity charge must be present before (or at least simultaneous with) the arrival of the massive lepton it will delimit and characterize. The mold must pre-exist the substance poured into it. The massive leptons would not "know" what form to take without the neutrinos to guide them. The presence of the neutrino precludes potential chaos during the initial "packaging" of energy into discreet, massive leptons during the Big Bang. Think for a minute, and you will realize that "Identity" is, and must be, matter's most primitive and basic charge (otherwise matter could neither recognize nor annihilate with antimatter - energy, symmetry, and charge conservation would be lost). How our universe manages to achieve conservation despite its glaring "matter-only" asymmetric composition is the major subject of this website. ([The charges of matter are the symmetry debts of light](#)).

[In the spirit of General Systems](#) in which this webpage is founded, I wish to note the following concordance: neutrinos are evidently the first elements of information to appear in our cosmos, and as we have suggested above, necessarily pre-exist the massive elementary leptonic particles for which they provide "[identity charges](#)" (implicit in the massive leptons, explicit in the neutrinos). To use an analogy, it is almost as if the neutrinos are the "souls" of the massive particles they code for - presenting us with a natural example of Platonic dualism. While the rational mind has only recently discovered massive leptons, neutrinos, identity charges, and the scientific concept of "Information", the intuitive mind long ago recognized the fundamental ontogeny of the cosmos in a single, simple statement: "In the beginning was the word".

Further in the same vein: when Moses asks God what his name (identity) is, God replies: "I am that I am". This is nothing less than a statement of absolute identity, sufficient unto itself, underived from any prior, higher, or more universal source. God simply IS, and cannot be encompassed, captured, or otherwise diminished by a name or category. When we refer to God, we refer to that which *cannot* be named. God is simply the "Almighty", the "First Cause" or "Prime Mover", the "One", the "Creator". We are all subdivisions of the eternal and universal "I AM", the everlasting, living identity of the cosmic "Creative Principle".

And what are we to make of the notion that humanity is created in the "image and likeness" of God? To me, this suggests the idea of God as the central, single, all-encompassing "Identity" of the Cosmos, from which the souls (identities) of his creations are derived - much as the "Big Bang" is the central single source of the neutrinos bearing identity charges of the elementary particles they will help create. We are created in the image and likeness of our universe. This is something [Chardin understood](#).

References:

Matthew Cobb: "*Life's Greatest Secret*". Basic Books, 2015 (good discussion of the "information" concept in the biological sciences)

Ray Jayawardhana: "*Neutrino Hunters*". 2013, Scientific American / Farrar, Straus and Giroux

Pierre Teilhard de Chardin: "The Phenomenon of Man". French: Editions du Seuil, Paris, 1955; English: Harper and Row, New York, 1959

Links:

[home page \(page 1\)](#)

[home page \(page 2\)](#)

[E-Book](#)