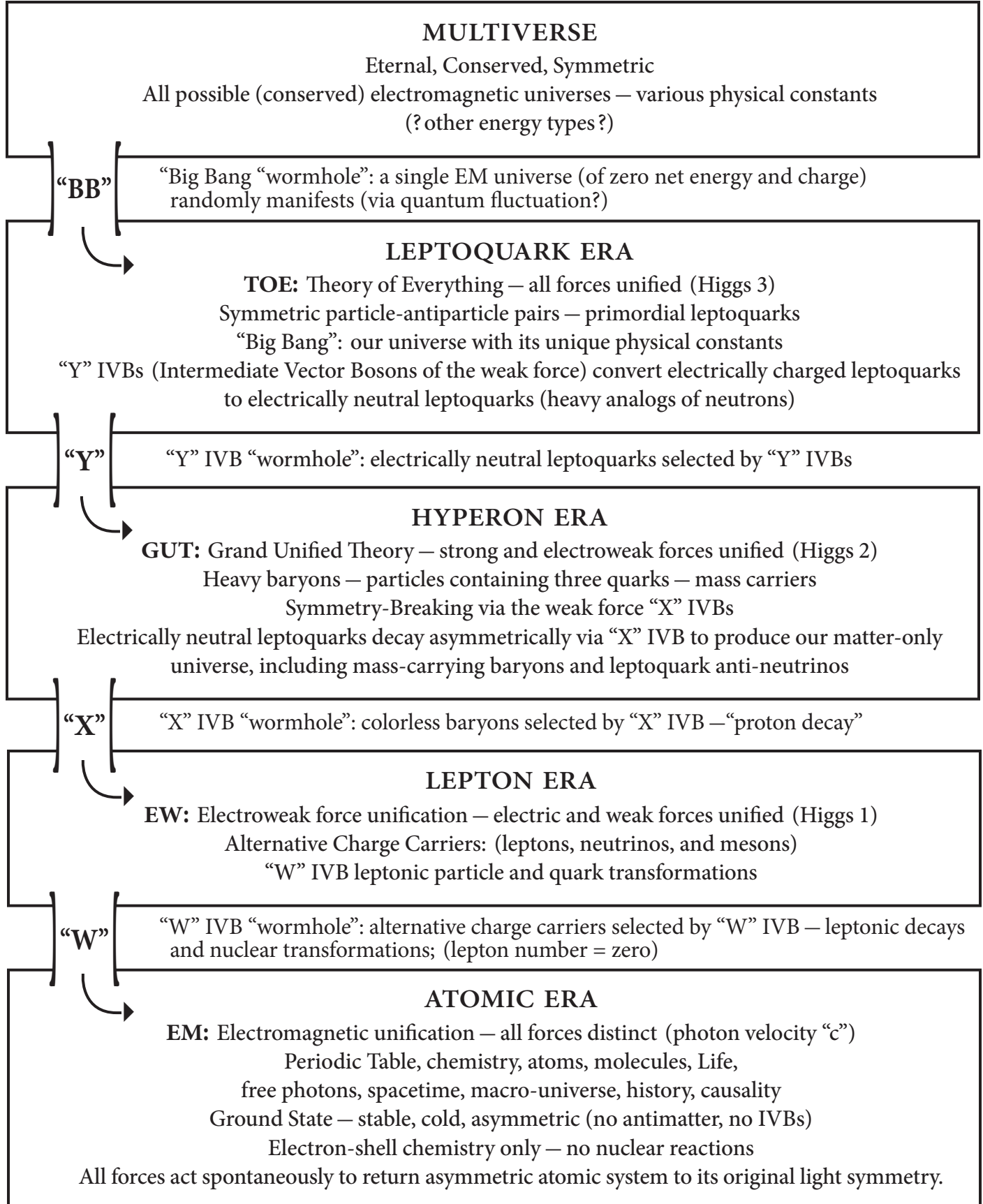


# Energy-Density or Force-Unification Eras of the Cosmos including “wormhole” weak force IVB connections between eras

(John A. Gowan, Feb., 2015)



## Energy-Density or Force-Unification Eras of the Cosmos [page 2]

The role of the weak force is to produce single elementary particles but with a stringent qualification: every elementary particle ever produced from the beginning of the universe (and onward into its future) must be exactly the same as its fellows within type (all electrons must be identical, and likewise the muon and tau). We have seen that the neutrino has a role to play in this process, allowing the creation of a single electron (for example) in the absence of a positron (anti-electron), and in effect certifying that any newly created electron is the genuine article in all respects.

See: “The Weak Force: ‘Identity’ or ‘Number’ Charge”. (<http://www.johnagowan.org/identity.html>)

But the actual mechanism of manufacture involves the hugely massive IVBs (81 proton masses) even for the tiny electron, which weighs about 1/2000 of a proton. Why is this huge “overkill” of energy during the creation process necessary? It is because the only way to circumvent the enervating effects of the entropy of a constantly expanding and cooling universe upon the manufacture of identical elementary particles over eons of time is to return to the original primordial energy density and creative phase of the Big Bang in which these particles were first formed - every elementary particle forged in the original mold, as it were. Every weak force transformation involving an IVB is therefore a recreation of a particular energy density of the Big Bang, but in miniature. Only by such extreme measures is the exact similarity of every electron (past, present, and future) guaranteed, and only these are given the neutrinos’ “certificate of authenticity”.

See: “The ‘W’ IVB and the Weak Force Mechanism”. (<http://www.johnagowan.org/weakforce.html>)

The energy-density recreated by the “W” IVBs is that of the electroweak unification energy density, and all of the leptons and mesons of the “Standard Model” (the alternative charge carriers) can be faithfully reproduced at this energy level. Hence we see the the “alternative charge carriers” (leptons and mesons) occupy a special place both in the functional hierarchy of the cosmos, where they function as catalysts facilitating the creation, destruction, and transformation of single elementary particles, and in the hierarchy of cosmic force-unification energy levels (the electroweak force-unification energy level of the “W” and “Z” IVBs). Baryons cannot be created or destroyed at this energy level, but their quark content can be transformed (via mesons). Creating/destroying the baryons themselves requires the next higher energy level of the “Grand Unified Theory” and the supermassive “X” IVB (unifying the electroweak and strong forces and allowing lepton-quark transformations). The force-unification levels themselves demarcate specific energy-densities at which elementary particles of various kinds can be created or destroyed: 1) leptons/mesons at the electroweak (EW) energy level; 2) baryons/hyperons at the “Grand Unified Theory” (GUT) energy level; 3)leptoquarks at the “Theory of Everything” (TOE) energy level.

One can think of the IVBs as “wormholes” to a younger, hotter universe, connecting our ground-state cold electromagnetic universe with the universe as it existed a few micro-seconds after the “Big Bang”. What comes through the “IVB wormhole” is a single elementary particle, newly minted in the original forge and mold of the electroweak era from long ago, and hence identical to every elementary particle (of its type) ever created, or that ever will be created. The “wormhole” connection effectively circumvents the enervating entropy of eons of cosmic expansion that would otherwise make the exact replication of single elementary particles impossible. After a little reflection it becomes obvious that this is the only method which can possibly replicate elementary particles reliably. It is this “wormhole” connection between our ground state electromagnetic and the primordial electroweak universe that frees the alternative charge carriers (leptons and mesons), held in the electroweak symmetric energy state, to do (in our ground-state universe) their necessary work of transformation, creation, and destruction of single quarks and leptons that allows atomic matter to exist, the Sun to shine, and the information-rich Periodic Table of the Elements to be built. The universe remains a single connected unit - not only in space, but in time and historic spacetime - a connectivity that is essential to its proper functioning and conservation.

See also: “Table of the Higgs Cascade” (<http://www.johnagowan.org/higgstable.html>);

“The Higgs Boson and the Weak Force IVBs”. (<http://www.johnagowan.org/higgs.html>)