A Summary of Forces

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home page (page 1)
home page (page 2)
E-Book

Our universe is derived from the "Multiverse" costing no net energy (the negative energy of gravity exactly balances the positive energy of electromagnetism), and bearing no net charge (primordial matter - antimatter balance). Our Universe is an asymmetric "breakout" from the perfect symmetry of the Multiverse (see intuitive description in Genesis) thanks to the Higgs boson(s) and its IVBs ("Intermediate Vector Bosons"), and the "Leptonic Spectrum" (including leptoquarks), and various Alternative Charge Carriers (which permit charge conservation despite the absence of antimatter).

While the actual mechanism producing our "matter-only" asymmetry is unknown, it clearly depends upon the ability of the partially-charged quarks to form electrically neutral combinations such as neutrons (this is the principle reason why we must have quarks and their partial electrical charges). And this electrical neutrality is also related to the reason why we have three energy levels of elementary particles (electron, muon, tau, and the 3 quark families): there are many more ways to form neutral baryons with three energetic families rather than one (presumably 3 is just enough to create our universe, or we would have more such families). (See: "Higgs Table".)

Neutrons are essential for the weak force asymmetry mechanism - tri-partite quark charges allow the creation of electrically neutral leptoquarks, which "live" long enough to decay via the asymmetric action of the (notoriously slow) weak force, creating our "matter

only" Cosmos. Creation must be symmetric (as in particle-antiparticle pairs), but decay may not be (if particles are electrically neutral).

The Weak Force = the "Information Force" ("identity" charge). Weak force asymmetric decay of electrically neutral primordial leptoquarks is the suspected cause of our cosmic "matter only" asymmetry. Neutrinos are explicit "identity" charges. Massive leptons carry "hidden" identity charges. Leptoquarks decay to baryons, which carry hidden leptoquark identity charges. Heavy leptoquark antineutrinos are the probable source of "dark matter". (See: "The Particle Table".) The IVBs of the weak force are very massive (80 - 90 Gev) because they recreate the primordial energy density of a specific "symmetric energy state" of the "Big Bang", in which the *single* elementary particles they transform were first created. This mechanism ensures that all elementary particles are identical (within type), no matter when or where they are created. Any electron can "swap out" with any other electron, or annihilate with any positron (anti-electron). This is just one example of symmetry in the service of conservation.

Massive IVBs are not subject to attrition via the entropic expansion of the Cosmos; "identity" charge is crucial to the accurate replication of elementary particles, or their antimatter annihilation partners.

The Electromagnetic (EM) Force = the "Action Force" (electric charge - attraction and repulsion). Magnetic forces are the relativistic effect of electric charges in motion; the conservation role of magnetic force is to maintain the invariance of electric charge. (Charge invariance is an essential adjunct of charge conservation). (See also: Global and Local Gauge Invariance in the Tetrahedron Model).

The Electroweak (EW) Force = action + information (our "real world" domain of the Periodic Table).

The Gravitational Force = a dimensional metric force converting space into time (and vice versa as in stars) (a conservative and negentropic force) ("location" charge). Time is a necessary metric for

energy conservation (and causality) in massive energy forms, due to their variable relative motion. For the same reason, time is not necessary for energy conservation (or causality) in light, whose intrinsic motion at "velocity c" is famously invariant (Einstein). The "black hole" is not just the triumph of gravity over light, but of time over space. However, this victory is ephemeral, as Hawking's "quantum radiance" has shown, and as Noether's Theorem leads us to expect. Paradoxically, due to "Hawking radiation", black holes represent the final triumph of symmetry and light over time, gravity, matter, and asymmetry. This is why black holes are so common in the universe - they are the "desideratum" - the final state of perfect symmetry (and besides "proton decay", the only way to vanish the stubborn "baryon number charge"). Recall that since time stops in the black hole, the final explosion takes place instantaneously from the viewpoint of an internal observer, even though many eons may pass from our (outside) perspective.

The combination of entropy plus symmetry conservation is necessary to understand the dimensional action of gravity. Entropy conservation is seen in the "neg-entropic" character of gravity. Spacetime reduces its expansive entropic dynamic via the inward flow of spacetime. This reduction exactly compensates for the lost outward pos-entropic force of the "intrinsic motion" associated with the light that was converted into atomic bound energy, now composing any gravitating mass. For example, the Earth's mass was once free light (during the primordial era of the "Big Bang") before those photons were converted into massive, asymmetric, "matter-only" atoms. During that conversion, light's intrinsic, pos-entropic expansive dynamic was lost, but since energy must always be associated with some form of entropy, that loss was compensated by neg-entropic gravity, creating time from space as the intrinsic driver of a new 4th dimensional entropic conservation domain (karmic history) for all bound energy forms. Symmetry conservation adds direction to the flow of space (toward the center of the asymmetric mass), and eventually results in the reconversion of bound EM energy to free EM energy, as in stars and other spontaneous astrophysical processes, culminating in the

"Hawking radiation" of black holes.

"Velocity c" is the "gauge" of a symmetric state of free energy (light); light has no time dimension, no spatial dimension in the direction of motion (light is a 2-dimensional transverse wave - light's 3rd spatial dimension is entropic); light has no mass, bears no charge, and produces no gravitational field in free flight. (The "accelerating expansion of spacetime" is the observational evidence for this latter assertion).

Because light's "clock" is stopped, and light has no third or "distance" dimension, light has forever to go nowhere in its forward "intrinsic" (entropic) motion. This is the basis of light's so-called "infinite" velocity, or light's "non-locality". Light is everywhere within its entropic conservation domain simultaneously. This is a crucial condition of symmetry, which gravitational charge ("location") conserves when light is converted to bound energy of any description.

According to Noether's Theorem, the symmetry of light must be conserved no less than its energy (quality as well as quantity). This great theorem is the key to Einstein's long sought "Unified Field Theory".
The charges of matter are symmetry debts of light. The "field vectors" of the forces maintain the invariance of the charges; hence they are adjuncts of charge/symmetry conservation.

History is the entropic conservation domain of bound electromagnetic energy (atomic matter), created by "intrinsic motion t"; space is the analogous entropic conservation domain of free electromagnetic energy (light), created by "intrinsic motion c". These two entropic domains are connected by negentropic gravity, which can create either from the other.

Entropy is a necessary adjunct of energy conservation as it prevents the same energy from being used twice to produce the same work (no "perpetual motion" machine; energy cannot be produced from nothing). Energy conservation itself is necessary because our

universe is "on loan" from the Multiverse, or from "the Void".

The Strong Force = the bound energy (nuclear) force ("color" charge) creating stable, long-lived energy reserves (baryons) which can be built into the 92+ atomic nuclei of the Periodic Table, providing a permanent information base for Life (via the Evolutionary (or "Life" Force) (Darwin x competition).

Charge conservation is one form of symmetry conservation. An important feature of symmetry conservation is that repayment of a symmetry debt (charge) can take place anytime in the future, unlike raw energy debts, which must be paid immediately (such as thermal energy debts). Charge conservation is the "credit card" of the universe: "buy now, pay later". Hence charge/symmetry conservation provides us with a (mostly) peaceful interval during which we can do something other than "pay the piper" - live our lives constructively, for example.

Life is the "sufficient reason" or rationale for the existence of our universe. Life is the universe becoming aware of, experiencing, and exploring itself on a local level. A possible global expression of this "life force" is suggested by Chardin, and by the 4x3 fractal algorithm of our "Tetrahedron Model". Life itself is the evidence for "God" in the Universe: Information + Action + Conservation + Creativity. Life is the runaway "computer computing itself" - the "Singularity", compounded like a fractal in the case of human science/math /technology and abstract thought/language/creativity. (See: "The Human Connection"). (See: the "Tetrahedron Model").

The "work" of the cosmos is the return of "bound" asymmetric atomic matter to its symmetric free state, light (as in our Sun and the stars). (See also: http://www.johnagowan.org/higgstable.html).

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home page (page 1)
home page (page 2)
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