

A Periodic Table of the Four Forces and the Unified Field Theory (General Systems Format)

| Forces: | Electromagnetic: (energy type) | Gravity/Entropy: (dimensions) | Strong: (mass carriers: particles) | Weak: (alternative charge carriers) |
|---|---|---|--|--|
| Symmetric Energy Input: Quantum Fluctuation From Multiverse (?) ("Big Bang") | Light: Free EM Energy; $E = h\nu$ (symmetric energy form) | Space: Entropic, A-causal Conservation Domain of Light; (intrinsic motion "c" = symmetric energy gauge) | Leptoquarks: Particle-Antiparticle Pairs (symmetric) | Symmetry-Breaking: "Y", "X" IVBs Create Single Matter Particles (from electrically neutral leptoquarks) (?) |
| Energy Conservation: Particles (mass, momentum); Asymmetric Energy Forms | Mass/Atomic Matter, Momentum; Bound EM Energy (asymmetric energy forms - no antimatter) $E = Mcc$ | Time/History; Causality; "Karma"; Spacetime Metric; Entropic/Causal Conservation Domain of Matter; Time is Created From Space by Gravity, Producing "Spacetime" | Hyperons, Nucleons, Baryons, Mesons, Quarks; Atomic Nucleus; Mass Carriers | Leptons/Neutrinos; Alternative Charge Carriers; Electron Shell; "W" IVBs (Intermediate Vector Bosons) |
| Symmetry Conservation: Charge <i>(the charges of matter are the symmetry debts of light - Noether's Theorem)</i> | Electric Charge; Symmetry Debt: Missing Antimatter (lost during the "Big Bang") | "Location" Charge (of gravity); Symmetry Debt: Lost Non-Local distribution of energy is lost whenever free energy (light) is converted to bound energy (matter)) | Color Charge; Symmetry Debt: Lost Whole Quantum Charge Unit (quark partial charges) | "Identity" Charge (of the weak force); Symmetry Debt: Lost Anonymity of Photons (elementary particles are distinguished by type) (neutrinos are explicit identity charges: left-handed = matter, right-handed = antimatter) |
| Maintenance of Charge Invariance and Final Payment of Symmetry Debts: Field Vectors; Local Gauge Symmetry Currents | Photons; Magnetic Forces (conserving invariant electric charge); Matter-Antimatter Annihilation (symmetry restored/conserved whenever bound energy is converted to free energy) | Gravitons; Lorentz Invariance (conserving the "Interval", Causality, and "velocity c"); Stars, Supernovas, Quasars, Black Holes, "Quantum Radiance" (gravitational conversion of bound to free energy) ("accelerating" cosmos, "dark energy") | Gluons, Mesons (conserving whole quantum charge units); Strong Force Fusion, Nucleosynthesis; Proton Decay (asymptotic freedom) | Weak Force IVBs: "W", "X" Families; (conserving elementary particle invariance, including invariance of "identity" charge); Fission, Radioactivity; Particle and Proton Decay; (leptoquark neutrino = "dark matter") |
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The 4x4 table above represents interactions of the 4 forces of physics with several conservation laws, most notably [energy, entropy, causality, and symmetry](#). The table may be read in the order of an

English paragraph - left to right, top to bottom. The first row represents the "Big Bang", which initiates our cosmic system. The origin is assumed to consist of an input of light (free electromagnetic energy), a perfectly symmetric energy form, [perhaps derived as a quantum fluctuation](#) (of zero net energy and charge) from the Multiverse.

In the first row, light expands and cools to establish space, the [entropic conservation domain](#) of free electromagnetic energy. Light has an alternative symmetric form consisting of particle-antiparticle pairs, in addition to its (simpler and perhaps more primitive) wave form. During the "Big Bang" the symmetry of these particle-antiparticle pairs (and the light which produced them) is broken by asymmetric decays mediated by weak force IVBs (Intermediate Vector Bosons), producing our matter-only universe. It is thought that this asymmetric transformation occurs in [electrically neutral leptoquarks](#) via "Y" and "X" IVBs of great mass and high energy, in the early micro-moments of the "Big Bang" or "Creation Event".

The argument of the table follows: the original input of energy may be transformed temporarily, but eventually (if not immediately) the total amount of energy must be conserved in some form (row 2 - atomic matter, mass and momentum), and the symmetry of the original light must also be conserved as charge (row 3 - Noether's Theorem): *the charges of matter are the symmetry debts of light*. (The nature of these symmetry debts which the charges represent and hold invariant (charge conservation) is also identified in row 3). The inertial forces of spacetime and the "Lorentz Invariance" of Special and General Relativity (shrinking meter sticks and slowing clocks) are analogous dimensional effects regulating the metric parameters of spacetime, necessary to hold invariant "velocity c", causality, and Einstein's "Interval".

Time and history constitute an [alternative entropic domain](#) for matter (bound electromagnetic energy), which having no intrinsic spatial motion, cannot directly participate in light's entropic, expanding spatial conservation domain. Time is created by the gravitational annihilation of space for the express purpose of accommodating matter's energy and entropy conservation requirements. The two metric and entropic systems of free and bound electromagnetic energy merge seamlessly into "historic spacetime", since the gravitational annihilation of space [leaves a metrically equivalent temporal residue](#), which is furthermore exactly calibrated (Gm) to the quantity of bound electromagnetic energy in play.

It is the principle role of the field vectors of the four forces to maintain the invariance of charge, velocity "c", the metric parameters of spacetime, etc. (The electromagnetic constant "c" is the gauge of both metric symmetry (inertia, causality) and the symmetric energy state of light (non-local timelessness), as well as gauging the entropic parameter of light's conservation domain (expanding and cooling via "intrinsic" motion "c"). Row 4 involves the maintenance of charge invariance by the field vectors of the forces ("local gauge symmetry currents"), as well as the final repayment (conservation) of the original energy and symmetry debts of light held by the mass and charge of atomic matter and any other forms of bound energy. All four forces spontaneously act to return bound electromagnetic energy to its free form (light), whether through matter-antimatter annihilations, gravitational processes converting mass to light (culminating in Hawking's "quantum radiance" of black holes), or the nuclear forces of fission, fusion, and proton decay. The 4x4 matrix form of the table has significance for [General Systems models of cosmic organization](#), a thesis elaborated in many

papers on my website. (See: "[Symmetry Principles of the Unified Field Theory](#)").

Alternative charge carriers (leptons/neutrinos), alternative entropic drives and domains (intrinsic motion "c" and space vs the one-way march of time and history), alternative forms of energy and symmetry (mass and charge); the Heisenberg-Dirac vacuum particle-antiparticle pairs (a secondary form of free electromagnetic energy) - all these dualities waiting to serve the purposes and conservation requirements of manifestation (the primordial symmetry of light and its particle-antiparticle pairs cannot be broken without them) - indicate convincingly that our material 4-dimensional universe is no accident, and that all these accommodations are simply part and parcel of a larger electromagnetic energy plenum which arrives (from the Multiverse?) fully prepared to materialize, moreover bearing native physical constants which regulate its processes and interactions, and guarantee its conservation.

We cannot help but remember (with astonishment) Plato's analogy of the prisoners in the cave whose view of reality is limited to shadows cast upon the wall. So too, we glimpse in the conservation laws and the alternative forms of energy, entropy, and symmetry (mass, time, charge) realities beyond the ken of surface experience.

This table does not address the information parameter of our universe, especially as elaborated in the Periodic Table of the Elements, the macro-universe, or the complex biological phenomena of life. Rather, this table represents a foundation stone in the hierarchy of these domains, which are treated in [other papers on the website](#). (See for example: "[The Information Pathway](#)" and: "[The Fractal Organization of Nature](#)".)