

Negentropic Information

John A. Gowan

2 Oct. 2011

[home page](#)

Abstract

Order and information (in the negentropic sense) are built upon charge conservation - the symmetry debts of light - symmetry transformed from a 2-D (or 3-D) atemporal, non-local, massless free energy form (light) to a 4-D, temporal, local, and massive bound energy form (charged elementary particles). With charge comes quantized mass, time, and gravity - the asymmetric "gang of four" necessary to conserve all the energy, entropy, and symmetry of the light that created atomic matter.

In physics today, the term "information" is largely synonymous with "entropy". Systems with greater entropy contain more information; an ice cube contains less information and less entropy than the same molecular system liquified, simply because it requires more information to specify the location or momentum of all the water molecules in the liquid vs the solid state. As a gas, the molecular system contains even more entropy, energy, and information. However, in the "[Tetrahedron Model](#)", as presented in these web pages, we are not interested in information as entropy, rather we are interested in information in the sense of order, which is to say, negentropy. In the example given of liquid water vs the ice cube, we are more interested in the crystal than in the liquid (or gaseous) phase. We are especially concerned with information in the sense of biological information, the highly complex order that characterizes living systems. Biological systems are negentropic systems, and in the only example we know (Earth-life), these systems have their energetic origin in the negentropic action of gravitation and the energy released by this force through our Sun.

The conversion of a purely entropic and symmetric flow of energy (such as a freely expanding system of photons or light), into a lesser entropic and finally negentropic flow of energy, is suggested by a trend among the three intrinsic motions listed at the "Entropy" vertex of the "[Tetrahedron Model](#)". First we list the intrinsic motion of light (as gauged by velocity c), the purest pos-entropic (and most symmetric) form of energy. Secondly, we list the intrinsic motion of time, which, because it is one-way and causally connected, has less degrees of freedom and is a more orderly (historically collimated and entangled) system entraining less positive entropy than pure light. Temporal systems will necessarily contain matter, that is, bound electromagnetic energy, whereas light is free electromagnetic energy. Finally, temporal systems necessarily contain gravity (since they contain matter), the final intrinsic motion we list at the Entropy vertex. Gravity, being a spacetime contractile force (or collapsing geometry), is as completely and purely neg-entropic as light is completely and purely pos-entropic. Time seems to be halfway between these extremes, and indeed, time is created by gravity from light's intrinsic motion and light's spatial conservation domain. Gravity creates time via the annihilation of space and the extraction (or revelation) of a metrically equivalent temporal residue. (See: "[The Creation of Time from Space by Gravity](#)".) The dimensions of spacetime are entropic conservation domains for free and bound forms of electromagnetic energy, created by the intrinsic (entropic) motions of light, time, and gravitation. (See: "[Spatial vs Temporal Entropy](#)".)

The creation of a local system of negentropic order from a non-local system of posentropic light is the story of the creation of our material Universe. Light is born with a spacetime metric: "In the Beginning", light and spacetime are created together, spacetime acting as the entropic conservation domain for light's energy. Spacetime and its metric are created by the intrinsic (entropic) motion of light: light is the only energy form which can create its own conservation domain from nothing (via its own intrinsic motion). The combination of light and its dimensional metric has (as we have discovered during the last century) another energetic

expression or form, manifesting as "virtual particles", typically elementary particles (such as electron-positron pairs) which flash into existence and then annihilate within the Heisenberg time limit for such virtual productions. These particle-antiparticle virtual pairs are simply the elementary forms of bound electromagnetic energy (matter) - the alternative form of free electromagnetic energy (light) - trying to manifest, knocking on the door, trying to gain a foothold in light's conservation domain, trying to establish its own alternative conservation domain (historic spacetime). Usually this attempt by the bound electromagnetic energy forms to manifest an alternative (and less symmetric) 4-D conservation domain is firmly suppressed via matter-antimatter annihilation reactions in which the bound elements destroy each other and return to their original form of 3-D light or free electromagnetic energy (a primary example of light conserving its own symmetric energy state).

It is an intrinsic and unexplained (a "given") characteristic of our universe that its principle energy form (electromagnetic energy) consists of two interchangeable types, free (light) and bound (atomic matter). The conversion of light into atomic matter has happened only once, during the "Big Bang", whereas the reconversion of matter into light has been ongoing ever since, a process of symmetry conservation or recovery, of which our Sun provides the prime local example.

The original and one-time conversion of light into matter requires both extremely high energy and breaking the symmetry of the primordial light universe via the weak force. (See: ["The Origin of Matter and Information"](#)). Some of the original particle-antiparticle pairs (about one in ten billion) do not annihilate each other; the antimatter member (probably an electrically neutral leptoquark) self-annihilates and leaves its matter counterpart without an annihilation partner, essentially isolating it in "real" time and the 4-D universe. The charges of the stranded partner, however, remain with it and are conserved (charge conservation). These are the same charges that were intended to produce an annihilation reaction with its antimatter mate, thereby returning the system to light and its original symmetric energy state. The conserved charges are therefore light's symmetry "debts", symmetry transformed to a manifest, 4-D particle form of conserved charges which are held indefinitely in the temporal dimension until they can find a suitable annihilation partner, that is, reunite with their lost antimatter mate or its equivalent. Order and information (in the negentropic sense) are built upon charge conservation - the symmetry debts of light - symmetry transformed from a 2-D (or 3-D) atemporal, non-local, massless free energy form (light) to a 4-D, temporal, local, and massive bound energy form (charged elementary particles). With charge comes quantized mass, time, and gravity - the asymmetric "gang of four" necessary to conserve all the energy, entropy, and symmetry of the light that created atomic matter. (See: ["A Short Course in the Unified Field Theory"](#).)

The charges of matter are the symmetry debts of light: this is a realization of "Noether's Theorem", and it is the pathway by which a purely posentropic system of light becomes transformed into an orderly system of atomic matter, conserved charges, and negentropic gravity. (See: [Entropy, Gravity, and Thermodynamics](#).) Free electromagnetic energy becomes transformed into bound electromagnetic energy via the asymmetric action of the weak force, but the indefinitely conserved charges of the bound atomic form are the symmetry debts of the free light form, charges which will act at every and any opportunity to return the derived bound system of lesser symmetry to the original free system of greater symmetry - in accordance with "Noether's Theorem". (See: ["Symmetry Principles of the Unified Field Theory"](#).) Noether's Theorem states that in any continuous, multicomponent field, such as the electromagnetic field (or the metric field of spacetime), where we find a symmetry we will find an associated conservation law, and vice versa. Charge conservation in matter and the inertial forces of spacetime are common examples of Noether's Theorem enforced in nature. The importance of symmetry principles in physics is precisely because they are associated with conservation laws. This is the great "Truth and Beauty" theorem, first realized in intuitive, poetic form by John Keats (1819) and in rational, mathematical form by Emmy Noether about a century later (1918).

Conservation laws and symmetry principles can be expressed mathematically, thus allowing the rational, abstract, and quantitative investigation, comprehension, and harnessing of natural law - humanity's universal

niche, the key to man's dominion over nature: mind over matter.

We do not understand the mechanism of weak force primordial symmetry-breaking (although I speculate upon this issue in "[The Origin of Matter and Information](#)"), nor do we understand its magnitude. Both seem to be "givens" of our Cosmos, perhaps determined randomly at the Multiverse systems level. This would amount to an "anthropic" explanation for these parameters - only in the subset of life-friendly material universes (all electromagnetic?) could the Cosmos become self-aware through creatures ("agents") like us and speculate about such issues. (See: "[The Information Pathway](#)".)

Links

Information

[Chardin: Prophet of the Information Age](#)
[Section VI: Introduction to Information](#)
[The Information Pathway](#) (text)
[The Formation of Matter and the Origin of Information](#)
[Nature's Fractal Pathway](#)
[The Destruction of Information](#)
[The Fractal Organization of Nature](#) (table No. 1)
[The Information Ladder](#) (table)

Entropy

[Section VII: Introduction to Entropy](#)
[Entropy, Gravitation, and Thermodynamics](#)
[Spatial vs Temporal Entropy](#)
[The Intrinsic Motions of Time, Space, and Gravity](#)
[Currents of Symmetry and Entropy](#)
[The Time Train](#)
[Traveling Twin Paradox: Covariance of Space and Time](#)
[The Halflife of Proton Decay and the 'Heat Death' of the Cosmos](#)

The Fractal Organization of Nature

[Section III: Introduction to Fractals](#)
[The Fractal Organization of Nature](#) (table)
[Part 1: Microphysical Realm](#)
[Part 2: Biophysical Realm](#)
[Part 3: Astrophysical Realm](#)
[Part 4: Metaphysical Realm - Intuitive Mode](#)
[Part 5: Metaphysical Realm - Rational Mode](#)
[Part6: The Fractal Organization of Nature \(summary\)](#) (text)
[Newton and Darwin: The Evolution and Abundance of Life in the Cosmos](#)
[Commentary on the Metaphysical Realm \(rational mode\)](#)
[The Human Connection](#)

Unified Field Theory

[Section I: Introduction to Unification](#)
[Section X: Introduction to Conservation](#)
[Section IX: Symmetry: Noether's Theorem and Einstein's "Interval"](#)

[Section XIV: Causality](#)

[Symmetry Principles of the Unified Field Theory \(a "Theory of Everything"\) - Part I](#)

[Symmetry Principles of the Unified Field Theory \(a "Theory of Everything"\) - Part 2](#)

[Symmetry Principles of the Unified Field Theory \(a "Theory of Everything"\) - Part 3 \(Summary\)](#)

[Unified Field Table: Simple Form](#)

[Principles of the Unified Field Theory: A Tetrahedral Model](#)

[\(Postscript and Commentary on paper above\)](#)

[Synopsis of the Unification Theory: The System of Spacetime](#)

[Synopsis of the Unification Theory: The System of Matter](#)

[Global-Local Gauge Symmetries and the "Tetrahedron Model"; Postscript](#)

[The "Tetrahedron Model" vs the "Standard Model" of Physics: A Comparison](#)

[A Short Course in the Unified Field Theory](#)

[home page](#)