STOE emergence

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Abstract

Emergent philosophy developed from the studies of biology, life, societies, and computer patterns. The Scalar Theory of Everything (STOE) model posits emergence theory models the universe. The STOE was developed from two basic agents and their interaction to the complexity of the cosmological scale. This model has described many mysteries of standard models including the structure of galaxy clusters, the microwave background temperature, rotation curves, asymmetric rotation curves, the relation of central mass parameters to outer galaxy parameters, galaxy redshift, periodic galaxy redshift, and the Pioneer Anomaly on the large scale. The STOE also suggests a photon model of light that describes Young's experiment, that rejected all wave models of light, and that described the results of the Hodge Experiment. It served as a base for explaining the Stern-Gerlach experiment. The STOE model made successful predictions of the Pioneer Anomaly and of the Hodge Experiment.

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Emergence philosophy was derived from observations of biology, life, and societies. Within each level of organization of the universe such as atoms there is a more elementary level such as electrons and nuclei. The same can be said of the cosmological scale, classical scale, and the quantum scale. The relation of the agents (electrons, etc.) of a level and the emergent level entity (atoms) follows the philosophical idea and rules of "emergence" philosophy. An emergent property is one that is not a property of a agent level and is a property of the emergent level (Sapolshy 2016).

The definition and characteristics of emergence vary. This paper is the view of the Scalar Theory of Everything (STOE) model.

Emergent agents and their simple rules of behavior form more complex entities and behaviors. The relation between the agents and the emerged entities is causal. Therefore, there exists a single Theory of Everything involving causal relations from the very small to the very large.

An unmodeled emergence condition is epistomatically present when model predictions of experiments fail or when the methods applied to one scale fail to apply to the reduced size scale. That is, when causal reductionism fails

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or a "probability" exercise without a clear causal model of the agents of the next lower level such as Quantum Mechanics (QM) is used. Generic atomism models failure is attributed to lack of knowledge or the predictions required are too complex. However, a change in the model of the agents, the properties of the agents, and the causes of the emergent entities can develop simpler rules and remove the necessity of a probability treatment. The STOE suggests the introduction of a discrete agent and a continuous agent. The introduction of a new agent has historically resulted in major advances in scientific models.

An unmodeled emergent condition is ontologically present when features of the universe are not reducible to the models of fundamental agents and when the models suggested are not looking for the agents in the emergent scale universe. A more useful model can be obtained by applying emergent theory to the more fundamental level. This implies applying a deterministic perspective to replace the probability arguments.

The emergent entity: (1) is composed of the agents, (2) is novel (much different than the agent and composed of many of the agents), (3) is a single, autonomous entity from which complexity occurs, (4) involves some element of holism, and (5) follows simple rules from which the emergent entity converges to follow new rules.

For example, emergence of the standard models suggested a real wave medium in QM and the "space" of General Relativity (GR) (aether of older models) are the same agent called the "plenum" acting on matter. Young's experiment suggested another agent that was smaller than the photon. The "hod" concept was the new building block (Hodge 2012b) of the STOE.

Convergence requires the entities have an attraction (addition) and repulsion (subtraction) system and have random (within our measurement ability) wandering ability. Convergence requires some form of selection or death of those structures that are not stable for the system to evolve. Being stable requires a form of more efficient packing. That is, one of the rules is a fractal (scale–free and self similar) universe because the fractal systems solve the packing problem[1]. The local universe of galaxies is evolving toward denser packing. However, the universe of many local regions and the emergence requirement for convergence suggests some locals must be in an "attraction" (adding agents) mode and other locals must be in a repulsion (removing agents) mode. Stability also requires that a negative feedback situation exists among the various entities and processes. Otherwise the new entities will decay over time. Examples include covalent bonding in chemistry and entanglement in QM.

Convergence produces the nearly constant universe temperature through a feedback relationship (Hodge 2006b). Gravity is an attraction emergent effect of the plenum. The repulsive emergent effects of the plenum are called "dark energy" and "dark matter". The "dark matter" effect is mislabeled in standard cosmology (Hodge 2006c). Therefore, the three emergent effects are aspects of one agent – the plenum (Hodge 2015b, and references therein).

[1]Packing greater amount of energy into smaller spaces such as transition of hydrogen gas into black holes.

We see increasing organization in our galaxy as the emergence philosophy suggests. This seems contrary to the second law of thermodynamics. The second law of thermodynamics applies to a closed system. Therefore, the universe must be an open system not the closed system of the Big Bang model.

The STOE model (Hodge 2015b) posits the Fractal Principle that all size scales have similar processes (math). Therefore, the very small scale has analogies found in our classical scale and not the bizarre features of quantum mechanics.

Categorizing emergence into strong and weak emergence is not useful in developing models much less in predicting observations. The distinction is whether a computer simulation can model the behavior of the agents to produce an observed effect of an emergent entity. Another form of the distinction is whether knowledge of the lower level agents can model the outcome of observation of the emergent entities. The STOE claims that all entities can be modeled by the behavior of their agents. The distinction is whether the current model of agents yields observed entities or whether a new model of the agents is required.

For example, is QM a valid emergence model? QM has computer simulations that correctly model observations. If the wave is considered a probability wave, QM is not about agents and, therefore, not a valid emergence model. If the wave is considered a real wave in a real medium, QM is about agents. But what agent causes the wave? Therefore, QM is close to a valid emergence model needing only an agent–the hod.

The apparent complexity of the entities seems a barrier to the limited computer accuracy and processing. However, the STOE posits a fractal universe that implies models of our Newtonian scale can be used as an analogy. The STOE also posits the universe is composed of negative feedback loops at all scales. For example, the STOE model of the behavior of a photon in Young's experiment and Hodge's experiment involves over 600,000 calculating steps for each photon and the calculations are done with four significant figure constants (Hodge 2015a, 2016b, and references therein). The photons are kept on course by several feedback loops. The 3-body problem may also be simulated using feedback loops rather than requiring extreme accuracy. The "fine tuning" of some parameter is also the result of a negative feedback relationship and convergence.

Reductionism and emergence has been suggested to yield different models because reductionism holds the whole entity is a sum of the parts. Generic emergence holds the whole is greater than the sum of the parts. The STOE holds the whole is a sum of the agents. If reductionism fails, it fails because the agents are modeled incorrectly. The entities and their characteristics in a given level of organization are the result of emergence and, therefore, are inappropriate to model the reduced level. Hence, the searching for agents should be for different properties that can form the emerged entities.

The cause of electromagnetism has posed a mystery. Several attempts have been made to link positive and negative charge to matter or particles. Magnetism has been modeled as resulting from the movement of charges. Therefore, particles with a magnetic moment have been modeled as rotating charges

on particles. These type models seem unworkable in the STOE view of only two constituents of the universe. How can identical hods have a positive and a negative charge?

The property of the agent hods is that hods cause waves of plenum. The emerged property of the photon is that the waves caused by each hod interfere (add and subtract) to yield diffraction and interference effects. Young's experiment and Hodge's experiment Hodge (2015a, 2016b) supported the STOE model and rejected all other models of light.

The QM model of the Stern-Gerlach experiment is that the spatial orientation of angular momentum is quantized. The mass of each particle is included in the derivation to arrive at the "spin" calculation. Thus, the differing masses of the fermions should yield a different "spin". The calculation also includes an assumption that the charge is distributed in the particle that produces the north-south (NS) axis of the particle. But the neutron (no charge) has a "spin".

The STOE suggests a classical explanation of the "spin" observations (Hodge 2016a,c). "Spin" is a misnomer.

The photon becomes polarized when passing through a magnetic field. Therefore, the emerged quality of the photon's response to a magnetic fields suggests the photon is acting like a bar magnet. Therefore, the hod agent of the emerged photon was posited to be a magnet with a north pole (N) on one side and a south pole (S) on the other. Moving hods produce the electric field.

STOE emergent theory suggests the photons are a column of hods, the neutrinos are an assembly of photons aligned next to each other with two nearly oppositely directed NS axis, the electrons are an assembly of neutrinos, the quarks are assemblies of electrons, etc. The neutrinos and, therefore, electrons having two NS axes that cannot be measured simultaneously can also cause the Stern–Gerlach experiment observations. The orientation of the electron as it progress through an inhomogeneous magnetic field is determined by one of two NS axes. The other fermions also have two axes that accounts for the same "spin" number for all fermions. The troublesome angular momentum model is unnecessary. "Space quantization" is unnecessary and incorrect (Hodge 2016d).

Conscience may be another emergent property from the neuron agents. The idea of the "grandmother" neuron has been disproved. The growth (evolution) functioning of the neural nets and bundles may provide the mechanism of consciousness (Sapolshy 2016). The simple rules need to be identified.

If emergence is a rule of the universe, then the STOE satisfies this rule when applied to the physics from the very small to the very large. All other models fail the emergence rule.

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