

A Comparative Study of 10(11) D Superstring Theory And The 10(11) Sefirot in the Tree of Life Metaphor of the Hebrew Kabbalah

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Abstract

Geometric symmetries in the 'Tree of Life' represented by the 10 Sefirot and the topology of spacetime geometry in superstring theory are contrasted with a discussion of metaphysical considerations.

Keywords: Cosmology; Kabbalah; Seferot; Superstrings

1.0 Introduction

Even with superficial knowledge of superstring theory and the Kabbalah, it becomes immediately obvious that there are many similarities between the two cosmologies even though one is physical and the other mystical. The main correspondence appears in the symmetry relations in the geometry of the 'Tree of Life' on the one hand and the topology of hyperdimensional spacetime on the other.

According to the Kabbalah there are no coincidences and no accidental events. Keeping this in mind it will be interesting to see how many similarities there are between the ten sefirot and ten dimensional superstring theory. The tree of life is centuries old and superstring theory was only created in the last decades. Do they both describe the nature of the universe around us? We will begin with a general description of the tree of life and then make a comparison with superstring theory.

2.0 Kabbalism

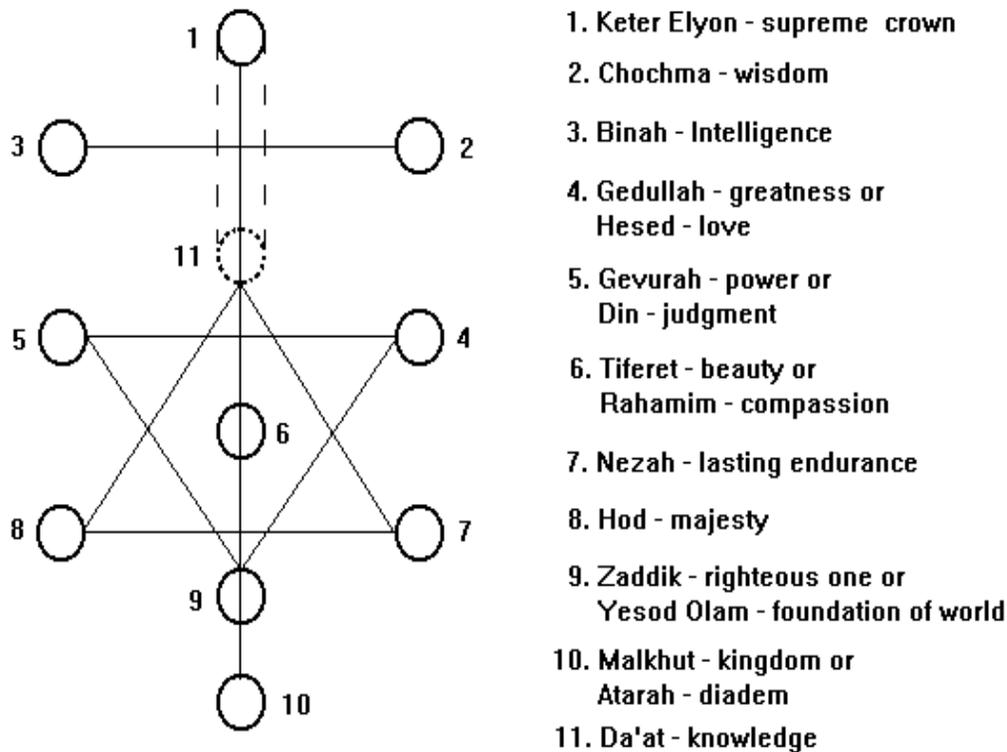
The 'Tree of Life' is considered a key to the portals of esoteric Jewish Mysticism known as the Kabbalah. The major proponent is the Lurianic system originating with Rabbi Isaac Luria who was born in Jerusalem in 1534 and is called the *Ari Hakodesh* (the Lion). The Ari was a Talmudic authority in beginning his teens; when he discovered the Zohar. He lived as a hermit for thirteen years studying Kabbalah. Current Jewish tradition suggests that a man should be about forty years old to have sufficient maturity to study Kabbalah. The Lurianic system focuses on the Ten Sefirot (Ten Luminous or Divine Emanations). The tree of life is a door to ultimate knowledge gained from insights by a long process of physical and spiritual experiences. Kabbalah comes from the Hebrew word L'Kabel meaning to receive. The Zohar is the major work of the Kabbalah; it is taught that each word - rather each letter has an important meaning in the comprehension of the forces of nature. It is through the *Sefer Ha'Zohar* that Israel may taste from the tree of life. There is a tradition that each blade of grass has its own angel that commands it to grow. Through goodness and study our awareness will be heightened to the mystical forces; and great knowledge not attainable to the illiterate or uninformed will be received.

3.0 Superstring Theory

Currently the most promising model for describing the unification of all elementary particles and forces with spacetime is Heterotic Superstring Theory; now in association with M or brane theory. Strings are defined as fundamental one dimensional curves the ends of which spin at the speed of light and which have superseded the classical concept of discrete points as fundamental units in space. In Newtonian physics space and time were separate; now with the advent of relativity, space and time are joined into spacetime and points don't exist as discrete fundamental units, but are fuzzy quantum fluctuations.

Progress in physics has come to a theoretical limit due to the measurement problem relating to Heisenberg uncertainty and a limit of the size of objects to what is called the Planck length of 1.6×10^{-33} cm that is difficult or in some cases currently impossible to make empirical tests of a theory. What is left is logic and mathematical simplicity or elegance. This deduction is taken in historical perspective where the correct theories turned out to have these properties. Since there are an infinite number of solutions to superstring theory this has so far been the only possible way to proceed. One could say physics is becoming based on faith and mystical exegesis.

In classical or Newtonian mechanics atoms and particles like electrons were considered solid objects. This was called the billiard ball clockwork universe model and all interactions were causal or totally predictable. Classical theorists believed that if one was aware of initial conditions one could calculate the future state of the whole universe at any point in time. Now with the advent of quantum theory, causality and predictability are no longer precisely possible other than



The Ten Sefirot and Sefirah Da'at

Figure 1. The 'Tree of Life' or 10(11) sefirot of Hewrew Kabballism. If all the sefirot are connected there are 22 lines or paths corresponding to the 22 letters of the Hebrew alphabet; corresponding to the 22 compactified dimensions of superstring theory.

through statistical analysis; and the correctness of a theory is often suggested by its beauty. The state of a system is a potential of probabilities and when an interaction does occur only the position or momentum can be measured accurately not both. This is the Heisenberg uncertainty principle wherein space does not reduce to points but compactified dimensions. The Planck length is believed to be a fundamental limit of nature below which nothing can exist. This is actually somewhat of a misnomer. All matter in the universe is made up of either Fermions or Bosons. Fermions obey the Pauli exclusion principle which means that only one particle can occupy the same state or space. Fermions are the substance of all solid matter. Bosons on the other hand can superimpose and an infinite number can occupy the same state or space. The photon of light is an example of a Boson. Thus getting back to the Planck length, this is a compactified barrier only to Fermions in the Continuous State Conscious Universe. Bosons which can fill any cavity may pass through translating channels of spinning strings into the higher dimensions. This is important to the foundation of our discussion comparing the ten sefirot and superstring theory because it is the avenue from four dimensional Minkowski space of everyday reality into the rest of the 10 (11) dimensions.

For string theory the most promising models provide solutions in ten dimensions. This is 10 - D spacial dimensions, where 10 - D form a compact space K ; so that altogether spacetime is $MD \times K$. A direct product of D dimensional Minkowski space which is our L, W, H + T phenomenological reality and K which are compactified or hidden dimensions. Other classes of solutions with $D < 10$ do not seem to admit such interpretations. $D = 10$ is also a special case in that it is the largest value possible. All of the three known types of string theory admit solutions with $D = 10$. And most interestingly a heterotic string, strings associated with spacetime dimensions of closed loop topology, has a symmetry of $S_0(32)$.

4.0 The Ten Sefirot

As a physical symbol the tree of life is composed of ten sefirot or digits with an additional sefirah the Da'at (knowledge) that is not real but an external manifestation of Sefirah Keter (crown). In number the ten sephirot can easily be seen to equate with the ten dimensions of spacetime. The Da'at sefirah that is invisible to the real aspects of the tree of life is like the dimension of time the connection of which is also an abstract part of our reality. This also equates with the eleventh dimension of string theory that is virtual and used to balance the symmetry. We live in a four dimensional reality and there are four aspects of the tree of life that constitute the secret of the holy name of YHWH. The Ze'eir Anpin - small face includes six other sephirot. This is like the six hidden dimensions of spacetime that we don't see in our four dimensional spacetime and thus the complement of six plus four dimensions.

The twenty-two paths between the ten Sefirot correspond to the thirty-two mysterious paths to wisdom. All spinning at the speed of light like superstrings in spacetime. In elementary crystallography there are thirty-two crystal classes that originate from the geometry of crystal structure. This is like the same symmetry structure of $SO(32)$ superstring theory.

The interrelation of the ten sephirot is a system of divine emanations. In comparison the ten dimensions of spacetime are governed by the resonances of the strings which create all the known particles that constitute matter. The correspondence is not as strong in the Naturalistic Big Bang cosmology; but in the ontological Continuous State Conscious Universe (CSCU) that contains an essential teleology or purpose that is mediated by the vitalism of the Noetic field, this relationship is much more pertinent.

5.0 Sidebar Providing Evidence for the Existence of God

As a sidebar to the interesting contrast between Superstring Theory and the Tree of Life superficial evidence can be claimed for the existence of God. If the reader accepts the metaphors presented in describing Superstring Theory and the Ten Seferot as mirroring the structure of reality to a certain degree, then using the basis for mysticism as a drawing out or exegesis, one might deduce that the reason the model of the Ten Seferot (which is itself a cosmology) fits so well with the supersymmetry of Superstring Theory, which is the best known model for describing the physical universe that science has to offer today, which is hundreds of years after the origin of the description of the Tree of Life; is because the mysticism of the Kabbalist actually divined the nature of the physical universe by tapping into the spirit of God that orders the large scale structure of the universe through gravitation. The graviton in the CSCU is a complex of confined photons. Graviton confinement is similar to quark confinement to the metric of spacetime; but in the CSCU case the graviton is photonic representing the unification of gravitation and electromagnetism. This means in addition to cosmological aspects of gravitation; the teleology of the noetic field is the action principle that autopoietically self organizes life as the vital force' and is also the light of the mind or consciousness. In both Eastern and Western theology, gravitation is stated

to be caused by the movement of spirit. In the ontology of the CSCU this light is physical and photonic. Even if parts of the theory turn out to be incorrect later as often happens in the evolution of science, it's factual basis will still remain in any new theory.

We normally consider light as inert packets of energy defined by Einstein as a quanta called the photon with no other order than the propagation of its electromagnetic field. Recently the work of the Jewish Kabbalist Stan Tenen has shown that the propagation of the noetic field is probably much more complex. His discovery was initially made by noticing a recursive geometry in the Hebrew alphabet of the book of Genesis. The geometrical relationships were soon seen to have a relationship to the structure of spacetime. Although the light coming from a movie projector onto the screen as a movie can on the one hand be seen as mere photon wavepackets; on the other in terms of the teleological action of the noetic unified field it can be seen to have a complex informational structure that relates to the scale invariant dynamics of the structure of the universe and intelligence.

Might we then assume that the early Kabbalists came upon the sephiroth through a true mystical connection with the cosmos? Of course the only way to know this for sure seems to be seeking one's own mystical experience to verify the facts of an Abba Elohim first hand. The question is, if we can agree that the mystical experience is an inherent part of the human psyche, deeper than the mere creative insight that study alone will yield, to the degree that spirituality with insightfulness comes from some deep synchronous connection with the cosmos. In such a case the exegesis gives us actual knowledge of the universe that could never be discerned by the associative connections that might come out of diligent study, pondering, and creative insight. Is this not reasonable evidence for the existence of a deity or at least a deep teleological ontology of consciousness inherent in the expanse of the cosmos? This consciousness would certainly seem to have an intelligence greater than our own.

6.0 Conclusions

The statistical probability of having the numerous similarities between Kabbalah and string theory occur by chance is nearly impossible. Both the ten sephiroth of the tree of life and 10 dimensional superstring theory have a large body of literature and tradition surrounding them. Both disciplines of thought contain a high degree of complexity and are descriptions of the universe in both metaphysical and physical terms. The high degree of correlation between the symbolism for two such disparate disciplines is quite astounding. The main question remaining is whether this vast synchronicity is part of some huge random coincidence or whether both have serendipitously described aspects of the same true reality. This paper has only done an introductory study. There is enough material available that could warrant expansion of the thesis into a volume on the topic. Answering the most intriguing question of whether or not both metaphors actually represent a deeper cosmology will have to be relegated to those seekers of true mystical exegesis.

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