

CASSIOPEIA'S ToE

6

Visualize a Wormhole

Fields

In this visualization, we will employ sets of wormholes for various Fields – Fermion Fields and Gauge Boson Fields. The boson fields are the Gravity Field, Electromagnetic Field (EM Field), Strong Nuclear Field, and the Weak-Higgs Field. All the other Fields of Quantum Field Theory can be similarly represented where necessary.

In each of the gauge boson Fields, there is a corresponding charge property that generates the wormholes in the gauge field:

Mass (and) Energy for the wormholes in the Gravity Field.

Electric Charge for the wormholes in the EM Field.

Color Charge for the wormholes in the Strong Field.

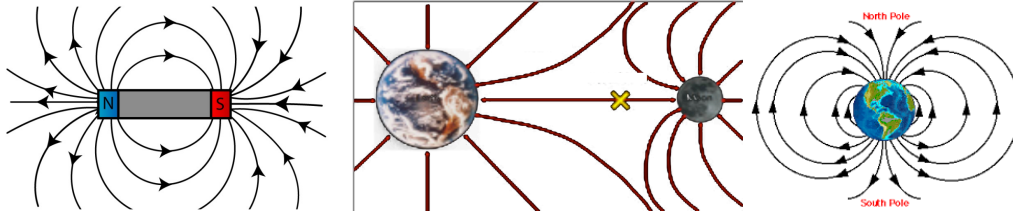
And the Weak-Higgs Plexus is complicated. For now, we will say it is the Weak Isospin with contributions from the Higgs Field that generates the wormholes in the Weak-Higgs Plexus. (More on this later)

We can think of these wormhole generators as different harmonics of the energy of the object that possesses the “charge”.

Visualize a wormhole

What should be a simple idea is going to get complicated before we're through. But let's dive right in and see where the guidance of the Standard Model (with a touch of String Theory) leads us.

Simply put, a wormhole causes two connected space quanta to behave as if they were adjacent. Wormholes are first and foremost a passageway. But we also want gauge boson wormholes to accurately represent the properties of the various fundamental interactions. And that makes the large-scale topology of gauge fields the easiest part. Scientists have been drawing field lines for a very long time...



So the pictures above accurately represent the large-scale features of the wormhole topology in a Field. Space is curved along the field lines, and gradients in the density of these field lines are felt as a force. (The wormholes themselves are not individually curved, but the sequence of them can result in a curvature in the large-scale topology)

In order to visualize wormholes on the quantum level, we have to address more specific issues. And since each quantum wormhole in a gauge field is a gauge boson, the wormhole (and the energy that generates it) must have all of the properties of that gauge boson: Spin and chirality and energy and mass (where appropriate) and charge (where appropriate).

And for wormholes that involve fermions, all the fermion quantum numbers must reside in the wormholes or in a stable grouping of wormholes... *lepton and baryon, number, flavor, charge, mass, hypercharge, spin, magnetic moment, etc.* As we said, our wormholes just got complicated!

We will assume each wormhole has a finite length that can be interpreted as a spatial distance. WE will further assume that it has some sort of width dimension that is determined by the oscillatory mode characteristics of the energy object inside.

THOUGHTS:

Do the wormholes have a length? (yes?) Does light take a finite amount of time to traverse them? (no? yes? maybe, but not limited by "c"?) Is there a shortest possible wormhole? (yes?) This suggests that there is an minimum distance between "neighboring" space quanta (or else the wormholes bypass the ones closer than their minimum length) . Is a wormhole connecting "non-neighboring" quanta longer than a wormhole connecting "neighboring" quanta? (yes?). This suggests that there is another dimension in which the quanta are immersed that gives measure to this physical wormhole distance... or perhaps space quanta ARE intrinsically connected—but only by "quiescent" wormholes – wormholes that exist but are not "open" – they are not passable until some energy presence energizes and "widens" them.

It is likely that the length (and width) of a wormhole is directly related to the particle that establishes it. We will postulate that all wormholes established by identical particle properties are identical.

If the distance between quanta is determined by the shortest possible wormhole, could an expanding space suggest that this distance is changing over time?

Of course it is possible that there are always connections between space quanta. And perhaps these connections are “inactive” unless some form of energy is present. We can further hypothesize that some minimal amount of energy (the non-zero point of energy in space) is always randomly flowing through these quiescent wormholes. Then statistics and probability will require that this random flow will regularly form nodes of concentrated energy sufficient to emerge into our reality as a virtual particle or particle pair. This is the true source of particles that seem to emerge briefly out of the vacuum, and this is what the uncertainty principle is quantitatively expressing.

Fermions and Bosons

What is the difference between FERMIONS and BOSONS ? Other than a difference in spin and related spin-statistics...

In our visualization fermions can have properties that cause alignments in gauge boson fields. But the reverse is not true. Gauge bosons can sometimes cause wormholes in other boson fields, but not in fermion fields (except when they temporarily morph into fermion pairs to become elements in those fermion fields.)

Fermions are wormholes that connect plexuses. They move **through** wormholes as they move through space (like a fluid flowing through multiple channels) and generating virtual bosons which means creating new wormholes as they go.

(Real gauge) Bosons are wormholes, without need of a generating fermion, that move through a Field and connect to the Gravity-Field (one boson = one wormhole). Real bosons can generate virtual bosons on their own if they carry the generating property. (So can virtual bosons – like gluons)

Since there are a limited number of types of (gauge), bosons this might say something about how many fundamental modes of vibration are possible for fermions to possess. (We equate a vibrational mode with each boson)

Classical Dynamics

Nothing much need be said about how our visualization looks under the microscope of classical dynamics. Conservation laws for energy, momentum, angular momentum, electric charge, color charge, baryon number, and lepton number all work fine in this model.

And as we explore ideas on a more modern level, we will try to visualize all of the symmetries that give rise to each of these conservation laws. (Emmy Noether style)