

# Brian Greene's Higgs Ocean and its implications for Haisch, Puthoff, Rueda ZPE inertia model

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"The Higgs Ocean and the Origin of Mass

If the Higgs field has a nonzero value – if we are all immersed in an ocean of Higgs field – then shouldn't we feel it or see it or otherwise be aware of it in some way? ... why objects resist acceleration ... The Higgs ocean in which ... we are all immersed interacts with quarks and electrons: it resists their accelerations ... and this drag ... contributes to what you perceive as mass ... And so we do feel the Higgs ocean." pp 260–261 of "The Fabric of the Cosmos" by Brian Greene.

Higgs Ocean = Vacuum Coherence.

More precisely

Vacuum Coherence = (Higgs Field) $e^i$ (Goldstone Phase)

Einstein's gravity emerges as ripples in the Goldstone Phase.

Both dark energy and dark matter emerge as ripples in the Higgs Field.

Now in the ordinary non-exotic weightless vacuum that neither gravitates as "dark matter" nor anti-gravitates as "dark energy", we have the optimal vacuum coherence. That is

Total Observable Random Zero Point Energy Density = (Bare Zero Point Energy Density)[(Quantum of Volume)(Higgs Field) $^2$  – 1]

The ordinary non-exotic vacuum in which we measure the mass of the electron has

Total Observable Random Zero Point Energy Density = 0

This means that

(Higgs Field) $^2$  = (Quantum of Volume) $^{-1}$

Origin of Inertia is ~ MACRO QUANTUM COHERENT Higgs Field

not to the RANDOM INCOHERENT transverse polarized virtual photons alone as Haisch, Puthoff and Rueda allege. That is the point.

How does the electron get its inertia? In this ordinary vacuum with ZERO RANDOM zero point energy density and zero ZPF pressure for each species of particle separately, hence no Casimir force from ZPF pressure only from VdW induced dipoles, The false vacuum massless charged Dirac spin 1/2 quantum field has the coupling

$g(\text{Higgs Field Quantum})(\text{Massless Electron Spinor})^*(\text{Massless Electron Spinor})$

Then in the pre->post inflationary false -> true vacuum phase transition with emergent MACRO-QUANTUM VACUUM COHERENCE = FORMATION OF THE COHERENT HIGGS OCEAN

$m(\text{electron}) \sim 10^{-27}$  grams ~  $g(\text{Higgs Field})$  a macro-quantum coherent true vacuum expectation value.

Now to do this right, we have to replace the rigid window Fourier transforms by multi-resolution wavelet transforms.

That is we can no longer use the Dirac transformation functions

$$\langle q|p \rangle = e^{ipq/\hbar}$$

So the dark energy we see at large scale need not have a strong effect on the lepto-quark rest masses at much smaller scale. That is we have scale power spectrum of the Higgs field to deal with.

We then have to connect  $m(\text{electron})$  with a micro-geon of Wheeler's "Mass without mass" as a Bohm hidden variable with an effective  $G^* \sim 10^{40}G$  on the  $10^{-13}$  cm scale.

Not only do we automatically get the correct Arrow of Time for the Second Law of Thermodynamics hooked to the expansion of space, but we also explain WHY NO ANTI-MATTER. That is, our universe must have a dual universe i.e. two parallel branes in which all the OPEN STRINGS are actually little Wheeler wormholes whose mouths end on the two different branes. A string is equivalent to a wormhole. The closed electric flux tubes are quantized because of the single-valuedness of the macro-quantum vacuum coherence local order parameter and in our universe brane all of the electron wormholes have their flux lines entering the mouths and exiting the mouths on the dual parallel brane next door across a small distance in hyperspace.

On Sep 27, 2004, at 3:26 PM, Jack Sarfatti wrote:

expanded typo-corrected 2nd draft from earlier message

Casimir Force: The irrelevant explanation of EVOs for the wrong reasons

On Sep 25, 2004, at 12:04 PM, Jack Sarfatti wrote:

Remember, macro-quantum vacuum coherence hides random micro-quantum zero point vacuum energy under the rug. Any random zero point energy that leaks out is exotic vacuum that contributes to the cosmological constant either as dark energy or dark matter depending on the sign of the pressure negative or positive respectively. Dark energy at a distance is a universal repulsive antigravity field. Dark matter at a distance is a universal attractive gravity field. Both fields can be stronger than what is expected from Newton's constant. That is the effective Planck energy is smaller than  $10^{19}$  GeV. However, as possibly in the case of Ken Shoulders "charge clusters" the effective forces inside an extended exotic vacuum region can change sign! Indeed, that is why the EVO is stable and that is also why the single electron is stable.

Alexander Burinskii in Moscow has rightly raised the issue of the distinction between renormalization and regularization of interacting field Feynman diagrams in special relativistic quantum field perturbation theory expansions in relation to the zero point energy problem. We need to see how all these ideas survive in quantum field theory in a c-number curved space dynamical background like in Birrell and Davies text book "Quantum Fields in Curved Space". The issue of the reality of quantum gravity foam of Einstein metric field Heisenberg uncertainty fluctuations is problematical in the soft condensed matter physics approach to gravity as a bottom-up emergent ODLRO macro-quantum phenomenon. That is gravity is a low energy effective c-number ODLRO macro-quantum coherent field theory that in principle is not to be quantized in the usual way the way QED is done. This feature is now being tested in gamma ray astronomy.

Why do Milonni's two naive free virtual photon field models of the Casimir force  $\sim hcA/d^4$  as virtual photon effects give, like Ptolemy's epicycles, closed to the correct empirical answer for the wrong reasons?

In the simple boundary condition model using only free virtual photons Milonni computes

$$E(d) - E(\text{infinity})$$

and he gets the cutoff-independent correct answer.

However, what he should compute is

$$E(d) + E(L - d)$$

Letting  $L \gg d$  at the end.

The virtual photon ZPF force is then the negative gradient of this sum. This vanishes in 1 + 1 space-time.

The cosmological constant problem is that  $E(d) + E(L - d)$  is directly observable in general relativity. This is why Hal's "Type II Casimir Force" model is unacceptable because it requires a huge cosmological constant vacuum energy filling all space outside Ken Shoulders EVOs which have zero ZPE inside their charged shells at least below  $h/mc$  short wave cutoff. This contradicts general relativity that is the covering theory here. Any result from unstable globally flat quantum field theory that contradicts general relativity must be rejected. That is the basic problem with what Hal Puthoff is suggesting for metric engineering of warp, wormhole and weapon. Puthoff's PV version of gravity is not consistent with Einstein's general relativity as shown by his own assistant Michael Ibison. Lest, there be any confusion, I am not suggesting that the direct warping of space-time by zero point energy density is the explanation of the Casimir force. Indeed, the Casimir force as a direct electrostatic force of mutually induced dipoles in the uncharged conductors is observable only in the absence of such strong zero point warping of space-time. I am suggesting that Ken Shoulders EVOs have such strong warping and have nothing to do with the Casimir force at all in the dominating approximation. Therefore, as Ian Peterson says, the Casimir force is not a way to tap the zero point vacuum energy of the virtual photons as the popular literature suggests. The only energy you can recover from the Casimir force is the weak mutually induced dipole electrostatic energies. Using the Casimir force as a pedagogical tool for zero point energy physics is profoundly misleading.