Retro-causal Holographic Dark Energy Coherent Vacuum Super-Solid Tetrad Emergent Gravity

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http://stardrive.org

Cal Tech APS 10/30/10

Abstract

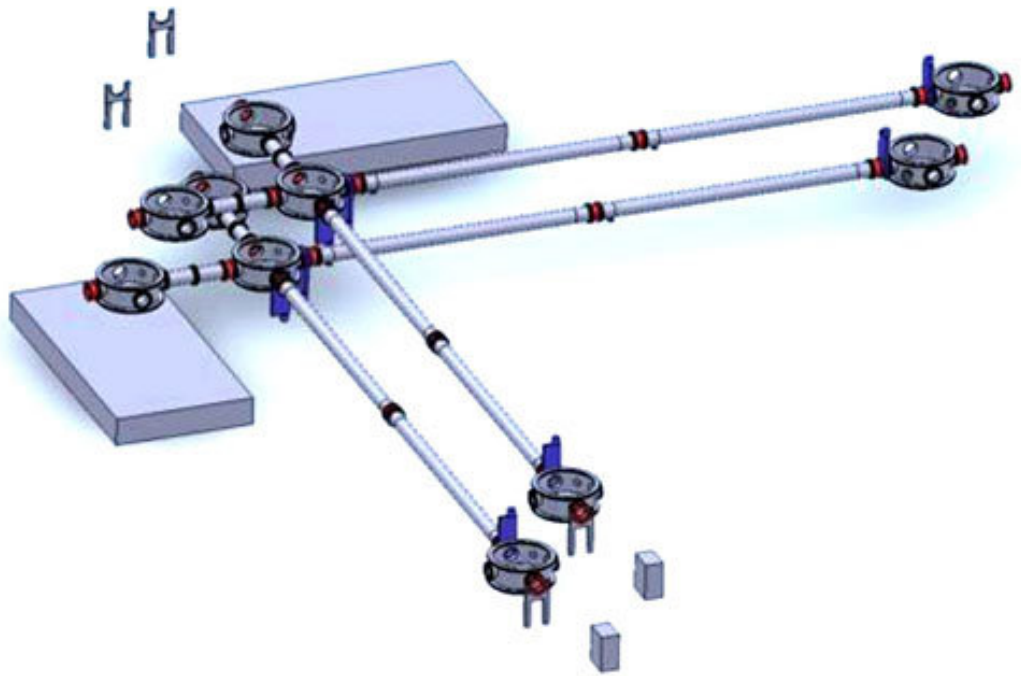
- **A short review of experiments and theory suggesting that the universe is a hologram image projected retro-causally from our future event horizon.**

Back FROM the Future

- A series of quantum experiments shows that measurements performed in the future can influence the present. Does that mean the universe has a destiny and the laws of physics pull us inexorably toward our prewritten fate?
- by Zeeya Merali From the April 2010, Discover Magazine http://discovermagazine.com/2010/apr/01-back-from-the-future/?searchterm=%20back%20from%20the%20future%20a

Craig Hogan at Fermilab Is Building A 'Holometer' To Determine If Reality Is Just An Illusion

- The holometer will measure for noise or interference in spacetime itself

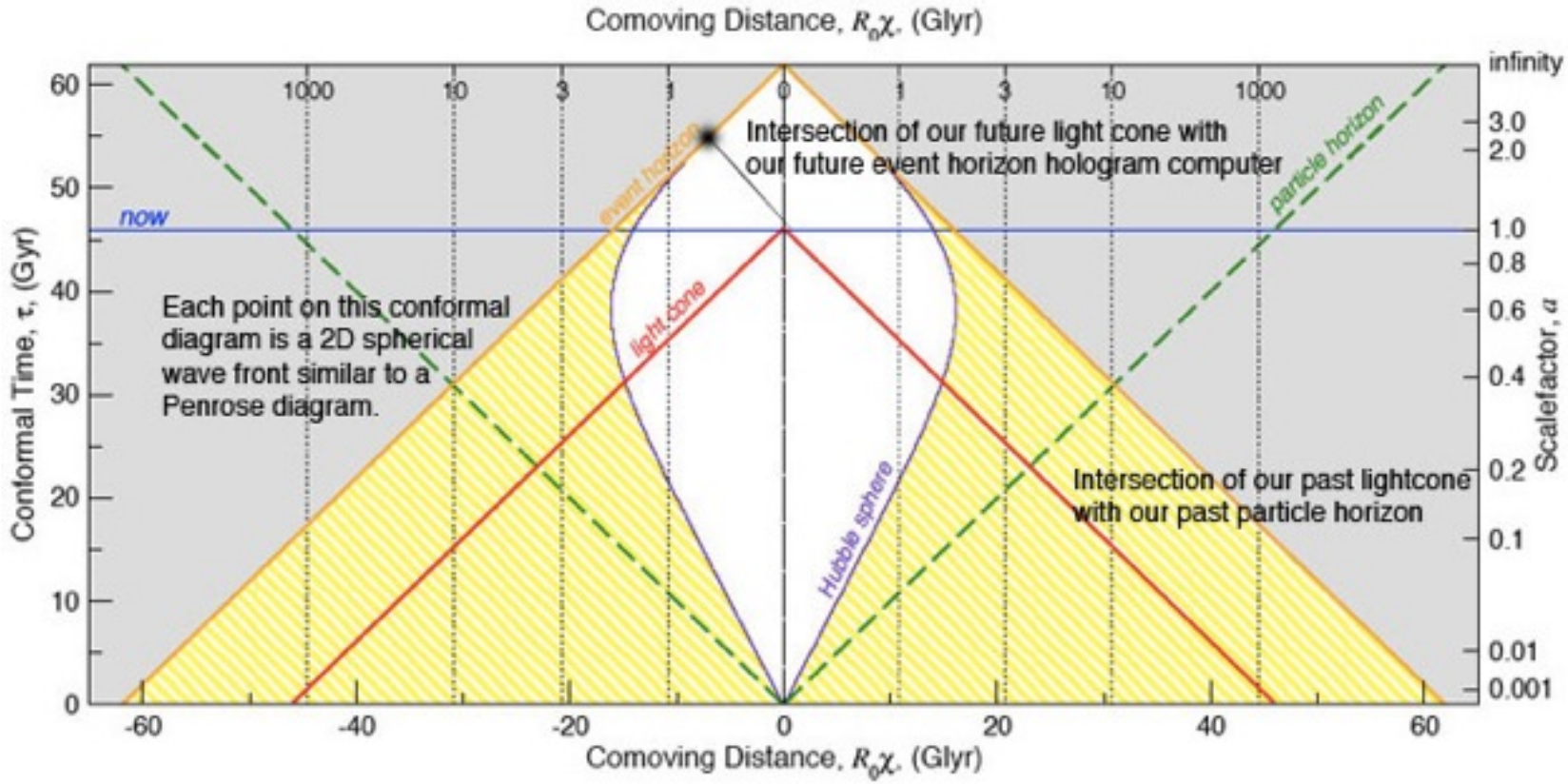


http://www.symmetrymagazine.org/breaking/2010/10/20/fermilab-scientists-to-test-hypothesis-of-holographic-universe/

Future dS Horizon

The cosmological *event horizon* separates events we are able to see at some time, from events we will never be able to see. At any particular time the event horizon forms a sphere around us beyond which events are forever inaccessible. An event horizon exists if light can only travel a finite distance during the lifetime of the universe. This can occur if the universe has a finite age, or if the universe accelerates such that light can travel only a finite distance given infinite time. This second criterion is satisfied for all eternally expanding universes with a cosmological constant, so most observationally viable cosmological models have event horizons

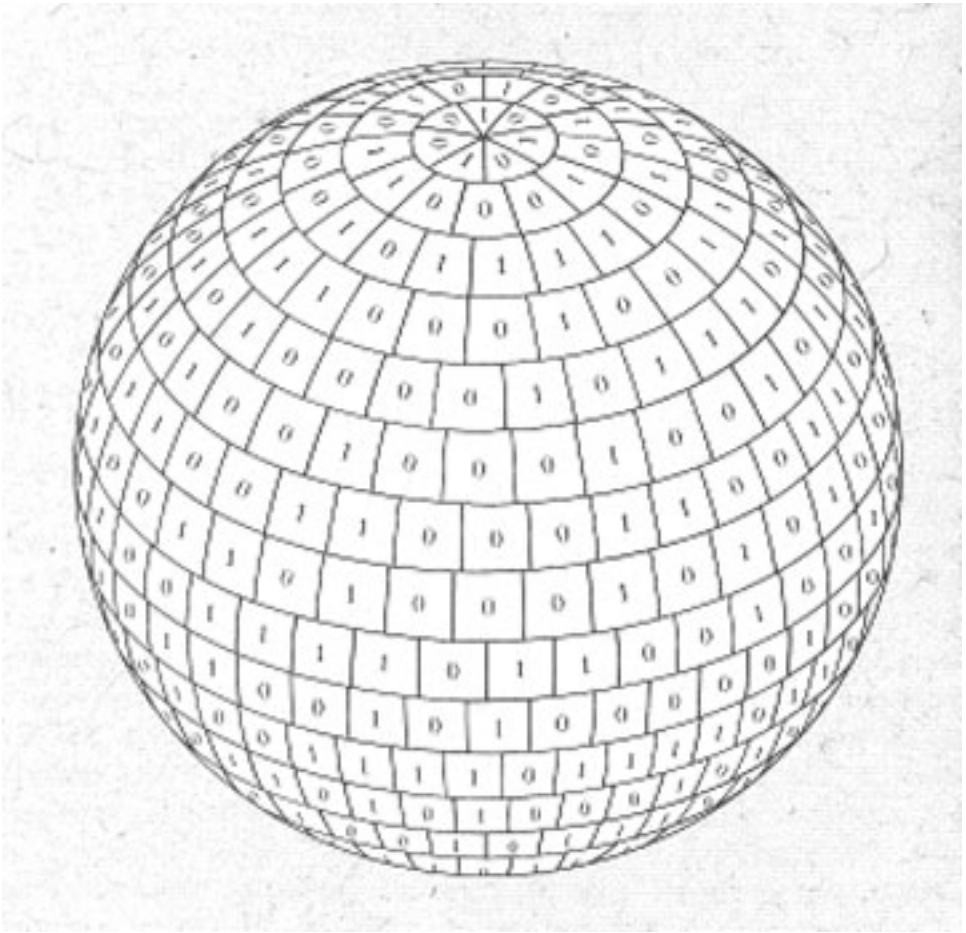
Tamara Davis Ph.D. 2004
University New South Wales
http://www.physics.uq.edu.au/download/tamarad/



What happens now depends on Wheeler-Feynman advanced signals from our post-selected future event horizon's intersection with our future light cone as well as on retarded signals originating at the intersection of our past light cone with our pre-selected past particle horizon.

Cosmic Computers

- We are outside a blackhole horizon.
- We are inside our future and past horizons.
- Seth Lloyd MIT thinks horizons are computers.



Hologram Principle

- The number of pixels N on the surrounding horizon surface area A equals the number of voxels in the interior bulk volume V.

$$N = \frac{A}{L_p^2} = \frac{V}{\Delta L^3}$$

$$\Delta L = \left(\frac{V L_p^2}{A} \right)^{1/3}$$

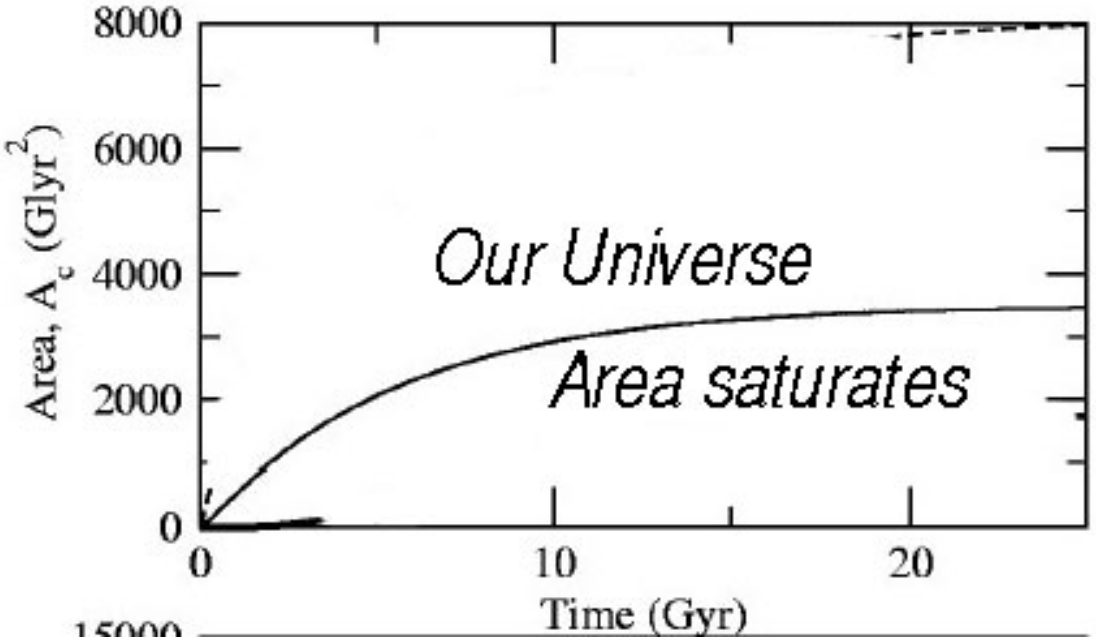
Dark Stuff is Virtual

- Negative ZPF pressure virtual bosons anti-gravitate as dark energy
- Positive ZPF pressure virtual fermion-antifermion pairs gravitate as dark matter.
- No real dark matter particles will be found.

Wheeler-Feynman

- We present a model for the origin of gravity, dark energy and dark matter: Dark energy and dark matter are residual pre-inflation false vacuum random zero point energy ($w = -1$) of large-scale negative, and short-scale positive pressure, respectively, corresponding to the "zero point" (incoherent) component of a superfluid (supersolid) ground state. Gravity, in contrast, arises from the 2nd order topological defects in the post-inflation virtual "condensate" (coherent) component. We predict, as a consequence, that the LHC will never detect exotic real on-mass-shell particles that can explain dark matter ΩMDM 0.23. We also point out that the future holographic dark energy de Sitter horizon is a total absorber (in the sense of retro-causal Wheeler-Feynman action-at-a-distance electrodynamics) because it is an infinite redshift surface for static detectors. Therefore, the advanced Hawking-Unruh thermal radiation from the future de Sitter horizon is a candidate for the negative pressure dark vacuum energy.
- Creon Levit NASA AMES & Jack Sarfatti
- http://iopscience.iop.org/1742-6596/174/1/012045
- PS infinite blue shift of retarded photons at horizon, infinite redshift of advanced photons from horizon back to us - for static LNIF detectors.

Past Dark Energy Density = 1/ Future Area



Entropy of universe = area of future horizon
Solves Arrow of Time problem.

The award winning 2004 Ph.D. dissertation of Tamara Davis from University of New South Wales (P.C. Davies on her committee) Figs 1.1 & 5.1 are very relevant to this discussion. The dark energy density we detect in our past light cone is the inverse area of our future event horizon in our future light cone. Therefore, it is our future event horizon that must be the hologram screen acting retro-causally in the sense of Wheeler-Feynman total absorber. Indeed the increase in area of our future horizon from inflation to its asymptotic constant de Sitter value in the causal diamond of our observable universe (defined by T. Davis) explains why the thermodynamic arrow of time is in same sense as the cosmological arrow and why the entropy of the early universe is so relatively small at the moment of inflation.

The Cartan exterior differential forms imply a kind of Dirac square root of Einstein's 1916 metric tensor spin 2 theory of the intrinsic curvature gravitational field. The Cartan gravity tetrad fields are spin 1 just like the electromagnetic-weak-strong forces. This suggests, according to Gerardus 't Hooft's work of ~ 1973 that quantum gravity should be renormalizable unlike the historical tensor version that is a composite of two spin 1 tetrad fields. The timelike geodesic LIF tetrad fields describe the zero g-force geodesics including light rays described by the Penrose-Newman null tetrads. Rindler and Penrose then show that the null tetrads are really composites of pairs of 2-spinor qubits http://vixra.org/abs/1005.0095 realizing Wheeler's

IT FROM BIT

Timelike LIF Cartesian tetrads are entangled Bell 2-qubit strings

$$\hat{i} \to \frac{1}{\sqrt{2}}\left(o^{A}\iota^{A'} + i^{A}o^{A'}\right)$$

$$\hat{j} \to \frac{1}{\sqrt{2}}\left(o^{A}\iota^{A'} - i^{A}o^{A'}\right)$$

$$\hat{k} \to \frac{1}{\sqrt{2}}\left(o^{A}o^{A'} - i^{A}\iota^{A'}\right)$$

$$\hat{t} \to \frac{1}{\sqrt{2}}\left(o^{A}o^{A'} + i^{A}\iota^{A'}\right)$$

Wheeler-Feynman advanced past light cone and retarded future light Penrose-Newman null tetrads as entangled 2 qubit strings.

$$\ell_{adv} \equiv \frac{1}{\sqrt{2}}\left(\hat{t}+\hat{R}\right)$$

$$\to \frac{1}{2}\begin{pmatrix}\left(o^{A}o^{A'}+i^{A}\imath^{A'}\right)+\sin\theta\cos\phi\left(o^{A}\imath^{A'}+i^{A}o^{A'}\right)\\+\sin\theta\sin\phi\left(o^{A}\imath^{A'}-i^{A}o^{A'}\right)+\cos\theta\left(o^{A}o^{A'}-i^{A}\imath^{A'}\right)\end{pmatrix}$$

$$= \frac{1}{2}\begin{pmatrix}(1+\cos\theta)o^{A}o^{A'}+(1-\cos\theta)i^{A}\imath^{A'}+(\sin\theta\cos\phi+\sin\theta\sin\phi)o^{A}\imath^{A'}\\+(\sin\theta\cos\phi-\sin\theta\sin\phi)i^{A}o^{A'}\end{pmatrix}$$

$$n_{ret} \equiv \frac{1}{\sqrt{2}}\left(\hat{t}-\hat{R}\right)$$

$$\to \frac{1}{2}\begin{pmatrix}\left(o^{A}o^{A'}+i^{A}\imath^{A'}\right)-\sin\theta\cos\phi\left(o^{A}\imath^{A'}+i^{A}o^{A'}\right)\\-\sin\theta\sin\phi\left(o^{A}\imath^{A'}-i^{A}o^{A'}\right)-\cos\theta\left(o^{A}o^{A'}-i^{A}\imath^{A'}\right)\end{pmatrix}$$

$$= \frac{1}{2}\begin{pmatrix}(1-\cos\theta)o^{A}o^{A'}+(1+\cos\theta)i^{A}\imath^{A'}\\-(\sin\theta\cos\phi+\sin\theta\sin\phi)o^{A}\imath^{A'}-(\sin\theta\cos\phi-\sin\theta\sin\phi)i^{A}o^{A'}\end{pmatrix}$$

$$m_{WF} \equiv \frac{1}{\sqrt{2}}\left(\hat{\theta}+i\hat{\phi}\right)$$

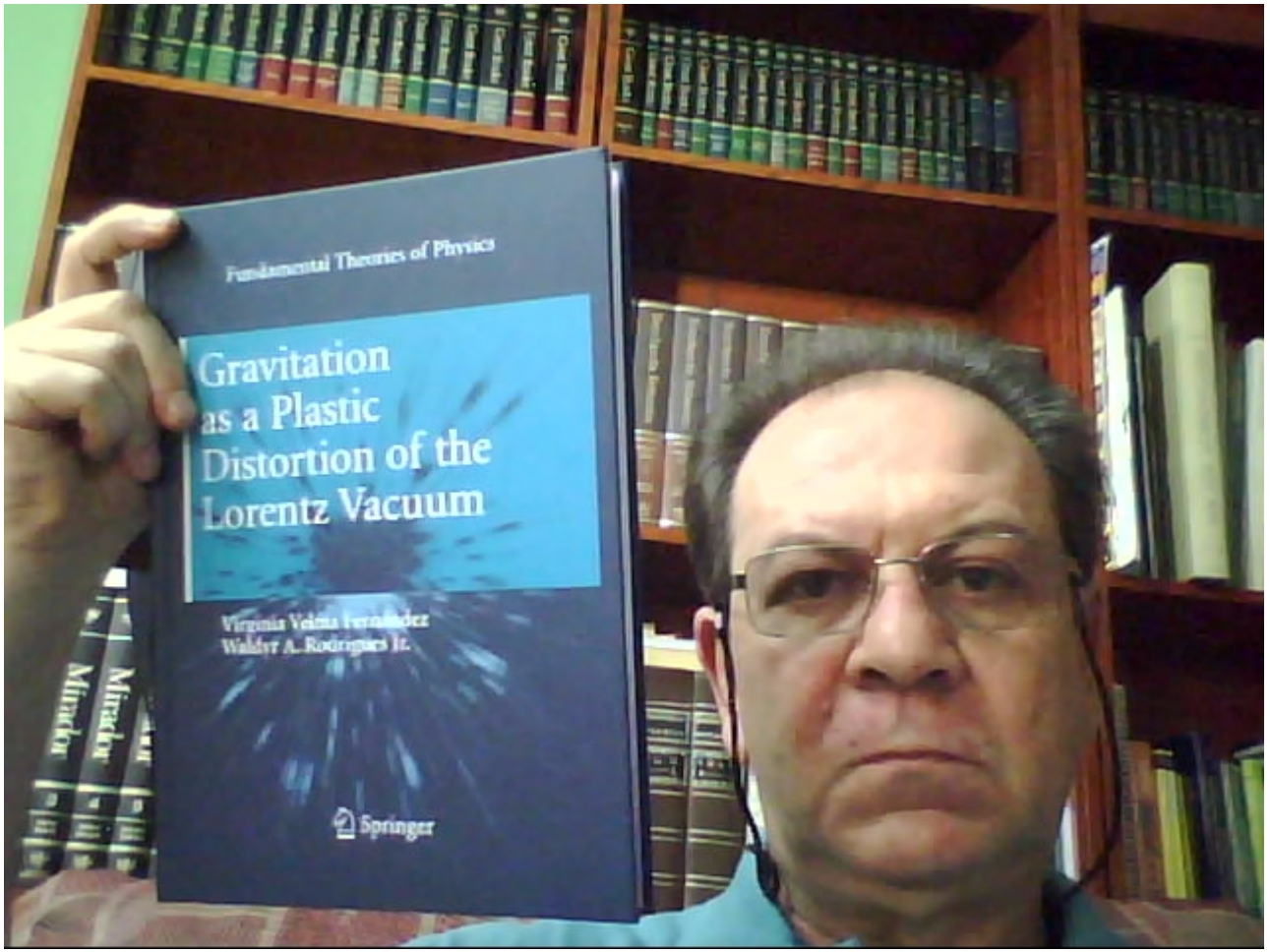
$$\to \frac{1}{2}\begin{pmatrix}\cos\theta\cos\phi\left(o^{A}\imath^{A'}+i^{A}o^{A'}\right)+\cos\theta\sin\phi\left(o^{A}\imath^{A'}-i^{A}o^{A'}\right)\\+\sin\theta\left(o^{A}o^{A'}-i^{A}\imath^{A'}\right)+i\left(-\sin\phi\left(o^{A}\imath^{A'}+i^{A}o^{A'}\right)+\cos\phi\left(o^{A}\imath^{A'}-i^{A}o^{A'}\right)\right)\end{pmatrix}$$

$$= \frac{1}{2}\begin{pmatrix}\sin\theta\left(o^{A}o^{A'}-i^{A}\imath^{A'}\right)+(\cos\theta\cos\phi+\cos\theta\sin\phi-i\sin\phi+i\cos\phi)o^{A}\imath^{A'}\\+(\cos\theta\cos\phi-\cos\theta\sin\phi-i\sin\phi-i\cos\phi)i^{A}o^{A'}\end{pmatrix}$$

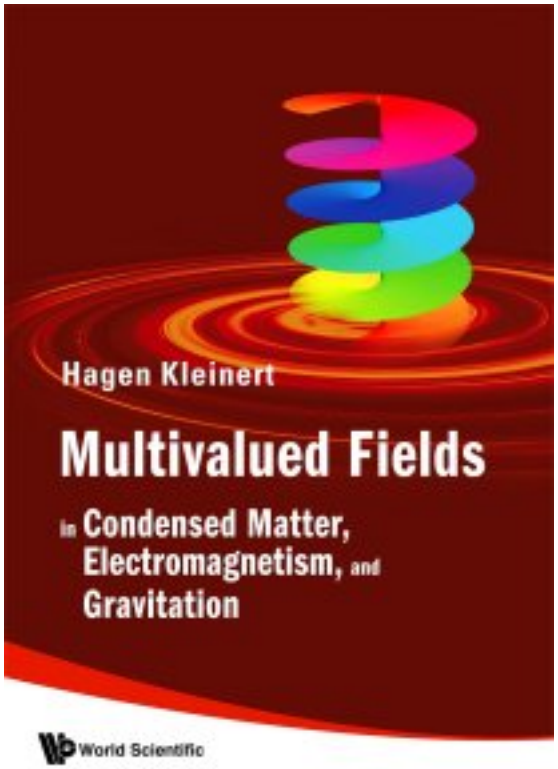
Hulse-Taylor Binary Pulsar

- The tetrad fields must be vector spin 1 fields i.e. e^I is a Lorentz group 4-vector, we are then faced with Hulse-Taylor pulsar dilemma of why we do not see massless far field gravity waves of spin 1 and spin 0 in addition to the spin 2. Using only spin 2 fits the pulsar data. So why do the spin 1 & spin 0 get a mass? Also, the observations are band-limited, so if there was an energy gap in the spin 1 & spin 0 gravity waves then that might explain why we have not seen them so far in the pulsar data, i.e. the propagating spin 1 & spin waves would have to be high-frequency perhaps like what Ray Chiao is trying to see with his superconducting EM-GW transducer?

Frank Wilzcek in “The Lightness of Being” describes the post-inflation multi-layered multi-colored vacuum superconductor. Just like the frictionless supercurrents in helium and superconductors are the gradients of the macro-quantum coherent Goldstone phases, the four Cartan 1-form gravitational tetrad fields and their associated six Cartan spin connection fields that couple leptons and quarks to gravity, derive from the eight massless gluon coherent Goldstone 0-form phases of the QCD SU3 strong force. This appears to be a deep unification of non-compact locally gauged T4(x) gravity with the compact SU3(x) strong force via a 4x4 M-Matrix from the eight vacuum gluon condensate phases. In other words, gravity comes from the disclination curvature and dislocation torsion distortions of what Hagen Kleinert calls the world crystal lattice, i.e. a 4D supersolid vacuum superconductor. Einstein’s 1916 theory is simply the low energy limit of the lattice theory. Even more astounding is the idea that this 3D + 1 lattice is a *back-from-the-future retro-causal hologram image* of the 2D+1 surrounding surface future event horizon. The number of hologram pixels equals the number of image voxels.



Waldyr Rodrigues Jr.’s new book - reference



Hagen Kleinert’s book - reference

Intuitive Mathematical “Nonsense” Model

$$(U1\times SU2)_L \rightarrow \left\{\Theta^{I=0,1,2,3}\right\}$$

$$(U1\times SU2)_R \rightarrow \left\{\Phi^{J=0,1,2,3}\right\}$$

$$SU3 \rightarrow (U1\times SU2)_L \oplus (U1\times SU2)_R$$

$$\left[\Theta^0, Q_{EML}\right] = 1$$

$$M^{IJ} \equiv \Theta^I d\Phi^J - \Phi^J d\Theta^I$$

$$e^J - I^J = M^{JJ}$$

$$\omega^{IJ} = M^{[I,J]}$$

$$ds^2 = g_{\mu\nu} dx^\mu dx^\nu = \eta_{IJ} e^I e^J$$

$$R^{IJ} = d\omega^{IJ} + \omega^I_K \wedge \omega^{KJ}$$

The 8 Goldstone phases are conjugate to the SU3 charges.