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”The only way of discovering the limits of the possible is to venture a little way past them into the impossible.”-Arthur C Clarke

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FORWARD

I have been at both physics and Electrical Engineering going on about 32 years now. But I have had two major interests all along. One is to better understand the Cosmos we live in. The other stems back to two events in my life several years removed from each other. The first event happened in Texas back in 1973 while taking a short trip across east Texas with my folks. The event was witnessing something that would be classified as a close encounter of the first type. What my folks and I saw out in east Texas was a very brilliant glowing object circular in shape due south of the road we where on above a cattle field. I and my folks remember pulling over to look at it and we remember driving away afterwards. But we do not remember anything in between.

The second event took place back in 1983 in Tucson Arizona while working for the Military. One evening I and several others had gone out into the desert northeast of Tucson to cook out and have a good time. What we did not know was several unidentified objects had been spotted out south of Tucson by workers up on Kitt Peak in the area of Ryan Field a small local airport south of Tucson.. These objects took a slow flight path out across Tucson towards the direction we where at.. I ended up being about 100 yards from one of these as it progressed across the valley. Close enough to see a lot of detail, to get a good idea by its general shape and size and flight aspects that this was not anything our Military had at the time. And believe me I knew a lot about what we did have at that time to base that finding on.

While I never saw any aliens or little green men. What I witnessed was intelligently controlled, had some motive power different from anything our planet uses and could have been a robotic probe similar to one’s we launch at present into space.. I also learned later that the Military on Davis Monthan had tracked these same objects that evening also. These two events sparked keen interests in space propulsion which later got utilized during the era of Alcubierre Warp Drive research with the group ESAA.

The Cosmology aspect of my involvement has taken many turns throughout the years. Starting with a model similar to the older Spinnor model and working my way up through String theory on into modern Brane Theory I have over the years played with several models. One what I would term a toy model can be found at the website titled A Modification To M-Theory. This model was never designed to be a real model. Though it did at one point get referenced by a British Press article along with some of Steven Hawking’s work. It was founded upon trying to get around a major problem String Theory had with providing too many vacuum solutions instead of the one that we exist in.

I utilized a bit of FEMM logic and started with our real universe vacuum situation and worked backwards to find a type of String Model that incorporated quantum field theory. The problem

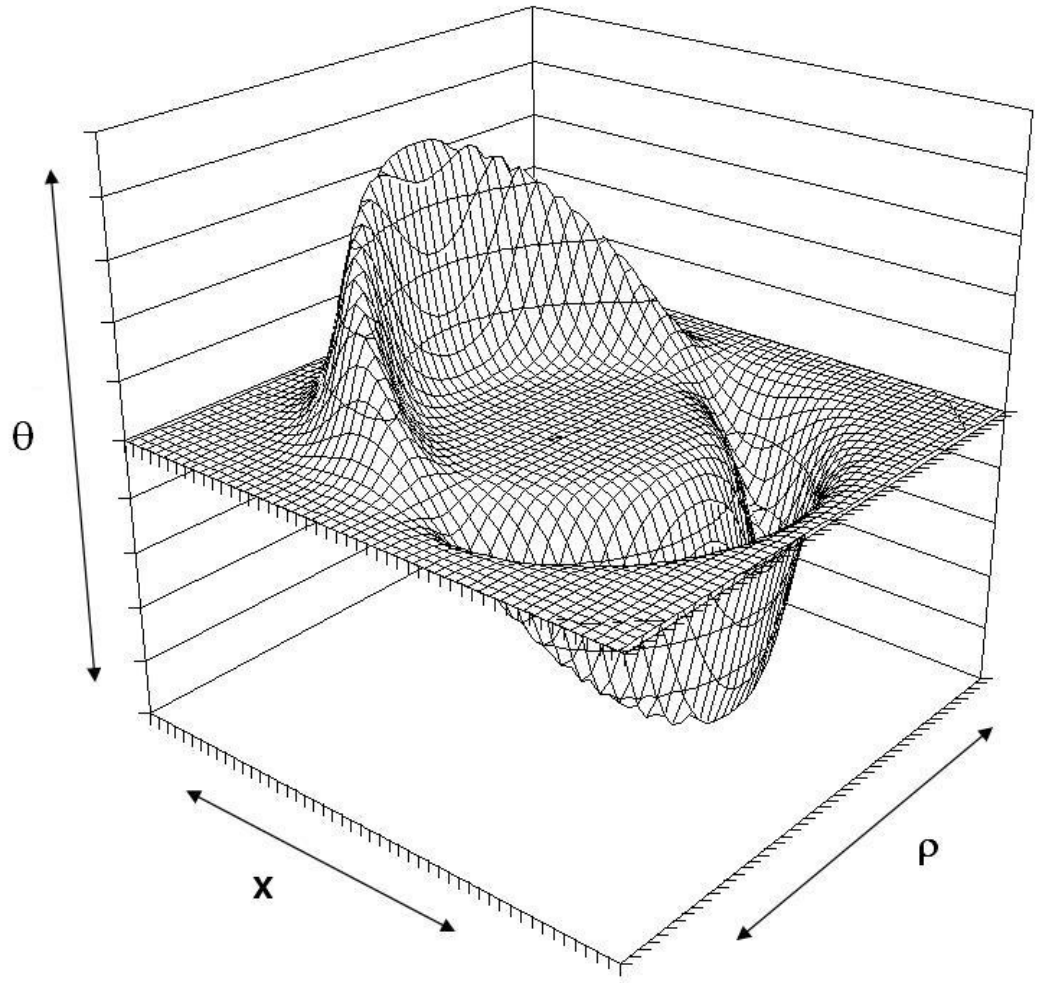
is the model has a sort of Aether embedded in it. Not exactly Newton's aether. But an aether none the less. However, in playing with certain numbers out of the whole model it did manage to provide a Neutrino mass solution within error range of the one later detected in labs.

About this time I had become a convert to what is now termed VSL (Variable Speed of Light) cosmology. It was just after this point that a friend of mine by the name of Fernando Loup developed interests in modern Brane Theory over problems we had encountered with AWD. Most of ESAA stayed together and continued work on AWD while Fernando went out on his own to pursue his idea. Our grounds for objection were we had enough problems to deal with out of AWD and Brane Theory had little observation evidence in its favor at that point. However, I myself had noted Brane Theory with Brane lensing could explain how C could appear a constant from one perspective and not be a constant from another perspective which is exactly what a lot of observational evidence was giving cosmologists.

INTRODUCTION:

Doctor Alcubierre's original proposal of warp drive within General Relativity(1) which was published in 1994 had an interesting origin in a simple enough question about if it was possible for a craft to actually warp space-time like the science fiction show Star Trek a lot of my generation had grown up watching. It was not Alcubierre's intent to design a field equation for a fully working "Warp Drive". He simply wanted to show that under General Relativity and metric based gravitational formulism such an exotic propulsion method was possible. But his article spawned a whole collection of Research groups, one of which, ESAA I became involved with many years later. For a short time it even generated a research branch within NASA known as the Breakthrough Propulsion Group or BPP(2).

The space-time metric that Alcubierre exhibited achieves its effect by replacing the zero velocity of the motionless points of empty space by the translational velocity vs(t), but only (to a near approximation)inside a sphere of radius R, which sphere.



Warp Field Plot showing Top Hat Function.

As any honest scientists will point out just because something can be shown correct by math does not translate to it being correct in the physical world. As none other than Albert Einstein pointed out, ”The supreme task of the physicist is to arrive at those universal elementary laws from which the cosmos can be built up by pure deduction. There is no logical path to these laws; only intuition, resting on sympathetic understanding of experience, can reach them”(3).

While something can be proven via math that is consistent and logical, physics for example, requires experimental and observational evidence that while derived from the math, transcends the math’s own version of proof with evidence that it does exist. The key to what Einstein was saying is the terms, “no logical path and only intuition” along with the word “Experience”. Experiment and observation are what true science is built upon when it comes to evidence and for all the different groups efforts, including the one I became involved with its that type of evidence all the honest research into what is commonly called Warp Drive lacks at the present time. That is the fundamental reason mainstream wise the Scientific community has tended to label all of this type of thought as rather Crackpot or a waste of time except that it does push the bounds of what can and cannot be done.

There are several main reasons for the rejection of warp drive that the scientific community has pointed out over and over against this theory. They are:

1.) Warp Drive requires negative or exotic energy and the Positive energy Theorem of Schoen and Yau(4) states that when the ADM four-momentum is timelike and future pointing, $E>0$, unless $P^a=0$.
2.) Control of the forward region of the warp drive space-time for navigation and velocity changes requires a faster than light control signal. This also goes hand in hand with the issue that for warp drive to work the field itself must be in motion FTL to begin with. While ESAA partly addressed this issue(5) the second half has to this date never been addressed. As some put it, Warp Drive requires a Warp Drive to create it.
3.) The energy requirement to create a warp field is way beyond our ability to generate, especially via some sort of ship carried field generator even if we had a working matter/anti-matter reaction system like the Enterprise had on Star Trek. Even if one includes a simple solution to this that was published(6) it still remains an issue.
4.) How to actually navigate and avoid objects in the path of the craft. Borrowing an ancient idea from reality and from SF I had proposed the field could be run in a pulsed mode and one could then navigate and change direction in between pulses. But that actually only side steps the issue and as Natario(7) pointed out it still remains a problem.

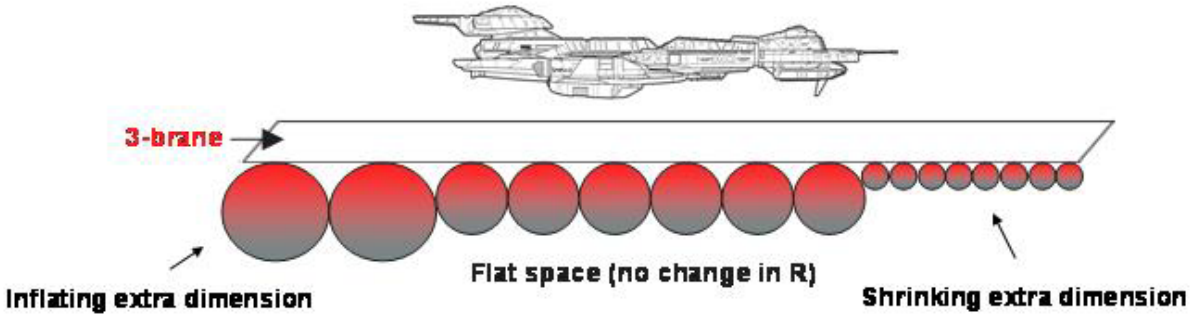
Thus, came along the idea of looking to Higher dimensions for an answer.

The question of where the extra dimension was located was addressed by Oskar Klein who, working with physicist Theodore Kaluza 1919 in 1926 suggestion and theory to explain the different forces in nature had suggested a 5^{th} dimension. Klein suggested that the fifth dimension compactifies so as to have the geometry of a circle of extremely small radius. You can get an idea of this spacetime by imagining a hosepipe. From a long distance it looks like a one dimensional line but a closer inspection reveals that every point on the line is in fact a circle.

Extra dimensions have become an accepted part of modern theoretical physics. Superstring theory, or M-theory in its most modern form referred to as Brane Theory, attempts to unify all known physics under a single mathematical and conceptual framework, and predicts the existence of extra spatial dimensions. Two of the more recent extra-dimensional models are the Randall-Sundrum (RS), which Fernando started with, and the Arkani-Hamed-Dimopoulos-Dvali (ADD) model which he later tended to follow in making suggestions for experiments to test the theory out. In the ADD model one would picture gravity as being free to propagate in all dimensions, while other forces are restricted to our familiar three spatial dimensions plus one time dimension.

Zero-point energy should also exist in higher dimensions. This is the energy of the vacuum itself who's origin point is the so-called Zero Point Scale or Planck scale. In these models it is the size of the extra dimension that directly regulates that magnitude of the cosmological constant, and therefore the expansion of spacetime. And in many of them that size can be a variable or at least controlled via alteration of the Israel Junction Condition which in turn causes Brane Lensing. This was the heart of Fernando's Hyperdrive Idea and that of R. Obousy and G. Cleaver in their paper Warp Drive: A New Approach. Their idea and an illustration of it shows it to be more in line with regular AWD type warp fields than with Fernando's except they follow his supersymmetry based modeling to suggest a way to

achieve an AWD field.

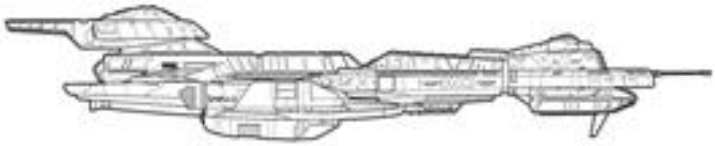


This model itself shares a lot in common with the old fictional Star Trek description of warp fields being overlapping fields that produce the warp effect. In itself, while offering a novel approach to how to create a Warp field, does not answer some of the other fundamental problems except perhaps how to get the field into motion.

Fernando's Model goes way beyond this and has the added benefit of us only having to enlarge a space-time region that already has the topology of an AWD warp metric. More on this in a moment.

However, the whole general idea behind the above suggests a third alternative. If we can alter the vacuum state, and evidence exists that certain aspects of brane lensing cause the local vacuum speed of light to possibly alter, then why not just create a bubble of space-time where C is higher and the craft can exceed our normal version of C. An example would be if a craft in normal space could reach say .5C, if that same craft was inside a vacuum state where C equaled twice the value here that same craft could travel in that space-time at 1C. Simply forget this:

and place this



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That may in fact be the simplest idea to come out of all the long research into possible Superluminal Propulsion in years.

Now lets examine Fernando's Hyperdrive idea.

In September 24, 2003 Fernando Loup and Paulo Alexandre Santos and Dorabella Martins da Silva Santos published(8) an article titled Hyperdrive A Go Go-The Star Wars Hyperdrive. Fernando went on after this to do some more published articles related to hyper drive(8). At this time the original ESAA group had split up separating with Fernando over the whole hyper drive idea. Our biggest problem is that brane theory was even more radical, with even more unanswered quantum questions to plague us.

His hyperdrive proposal was based upon the following: The Planck scale can be written as a function of some very well known constants for which its expression was obtained by a research group at the University of Amsterdam Holland(9). In the Dutch equation

$R=4P^2_o Gh\text{-cross}^2 m_0 / e_0$

Where G, Planck's constant, M and e have the standard values of the present vacuum state. With Fernando and our own group we had been utilizing a polarized vacuum modeling based somewhat upon Hal Putnoff of the University of Texas own PV alternative to GR(10). In this type modeling e is no longer a constant and can vary. Which translates to C itself being a variable as well as the Planck scale being also a variable when it comes to size. In fact, the

hyperspace of Fernando's hyperdrive Brane Theory based model is actually the Planck scale itself. So putting aside for a moment the issue of if the planck scale can be varied normal quantum theory should give one a sound idea of what he was trying to point out. However, bare in mind that what follows hinges solely upon the whole general PV approach to begin with.

Fernando went on to show the following case example:

Considering the metric

$$ds^2 = dt^2 - e^{2\alpha} dX^2 - dH^2$$
$$\alpha = -kH + \ln[a(t)]$$
$$e^{2\alpha} = e^{2(-kH + \ln[a(t)])} = e^{-2kH} e^{2\ln(a(t))}$$
$$e^{-2kH} e^{2ln(a(t))} = e^{-2kH} a(t)^2$$
$$ds^2 = dt^2 - e^{2\alpha} dX^2 - dH^2$$
$$ds^2 = dt^2 - e^{-2kH} a(t)^2 dX^2 - dH^2.$$

It follows

$$ds^2 = dt^2 - e^{-2kH}a(t)^2dX^2 - dH^2$$

$$a(t) = e^{-(\sqrt{2}kt+Yt)}$$

$$0 = dt^2 - e^{-2kH}a(t)^2dX^2 - dH^2$$

$$0 = 1 - e^{-2kH}a(t)^2\frac{dX^2}{dt^2} - \frac{dH^2}{dt^2}$$

$$1 = e^{-2kH}a(t)^2\frac{dX^2}{dt^2} + \frac{dH^2}{dt^2}$$

$$e^{-2kH}a(t)^2\frac{dX^2}{dt^2} = 1 - \frac{dH^2}{dt^2}$$

$$\frac{dX^2}{dt^2} = \frac{1}{e^{-2kH}a(t)^2}\left(1 - \frac{dH^2}{dt^2}\right)$$

$$\frac{dX^2}{dt^2} = \frac{e^{2kH}}{a(t)^2}\left(1 - \frac{dH^2}{dt^2}\right)$$

$$\frac{dX}{dt} = \frac{e^{kH}}{a(t)}\sqrt{1 - \frac{dH^2}{dt^2}}.$$

We observe that k is large for Brane Lensing. In turn, H doesn't need to be large and

$$\frac{dH}{dt} << 1.$$

From which we find

$$\frac{dX}{dt} >> 1$$

And

a=1/eÖ2kt +Yt

Manipulating this we get

$$\frac{dX}{dt} = \frac{e^{kH}}{e^{-(\sqrt{2}kt+Yt)}}\sqrt{1-\frac{dH^2}{dt^2}}$$
$$\frac{dX}{dt} = e^{kH}e^{\sqrt{2}kt+Yt}\sqrt{1-\frac{dH^2}{dt^2}}.$$

Consider then

$$T^{00} = -6k^2 + 3\left(\frac{1}{a}\frac{da}{dt}\right)^2$$
$$T^{00} = -6k^2 + 3\left(\frac{d\ln(a)}{dt}\right)^2$$
$$T^{00} = \left(g^{00}\right)^2 T_{00},$$

1

Where $g^{oo}=1$ we have

$$T^{00} = -6k^2 + 3\left(\frac{1}{a}\frac{da}{dt}\right)^2$$
$$T^{00} = -6k^2 + 3\left(\frac{d\ln(a)}{dt}\right)^2$$
$$T^{00} = \left(g^{00}\right)^2 T_{00},$$

1

$$a = e^{-(\sqrt{2}kt+Yt)}$$
$$\frac{1}{a} = e^{\sqrt{2}kt+Yt}$$

So that

$$\begin{aligned}\frac{da}{dt} &= \frac{de^{-(\sqrt{2}kt+Yt)}}{dt} \\ &= e^{-(\sqrt{2}kt+Yt)}(-1)(\sqrt{2}k+Y).\end{aligned}$$

We find

$$\frac{1}{a}\frac{da}{dt} = e^{\sqrt{2}kt+Yt}e^{-(\sqrt{2}kt+Yt)}(-1)(\sqrt{2}k+Y)$$
$$\frac{1}{a}\frac{da}{dt} = (-1)(\sqrt{2}k+Y).$$

From which we derive

$$T^{00} = -6k^2 + 3\left[(-1)(\sqrt{2}k+Y)\right]^2$$
$$T^{00} = -6k^2 + 3\left(Y^2 + 2\sqrt{2}Yk + 2k^2\right)$$
$$T^{00} = -6k^2 + 3Y^2 + 6\sqrt{2}Yk + 6k^2$$
$$T^{00} = 3Y^2 + 6\sqrt{2}Yk.$$

When we maintain

$$3Y^2 > -6\sqrt{2}Yk,\ T^{00}$$

To obey the positive energy theory with the limit case we get

$$3Y^2 + 6\sqrt{2}Yk = 0$$
$$3Y^2 = -6\sqrt{2}Yk$$
$$Y^2 = -2\sqrt{2}Yk$$
$$Y = -2\sqrt{2}k$$
$$T_{00} > 0$$
$$Y > -2\sqrt{2}k$$

When

$$T_{00} = 0.$$

where k is the coefficient for the Chung-Freese Brane Lensing.

The total energy needed for local brane lensing is given by

$$E = \int T^{00} dV.$$

From this he showed in this example the energy needed to enlarge the Planck scale was both positive and small by astronomical terms compared to the energy needed for Alcubierre's version of an FTL drive. But even Fernando never took a direct look in any article at the type of space-time his field would enlarge and it's properties.

It was Dirac(11) who first pictured this region as populated in whole by negative energy states. Modern Casmir(12) experiments have shown that smaller and smaller artificial barriers allow less and less energy wave modes to exist within their barrier, making the vacuum state within less. Theory predicts at the Planck scale and below the actual energy state would be negative. Now any simple look at Einstein's Special Theory of Relativity when one plugs in negative energy one gets velocity results that are tachyon like and predict FTL states. This is where the whole idea of hyperspace as far as physics goes derives the hyper light velocity effect from. But Fernando and very few others have ever published anything on what the actual velocity of light is within hyperspace even though there is a way to figure it out,

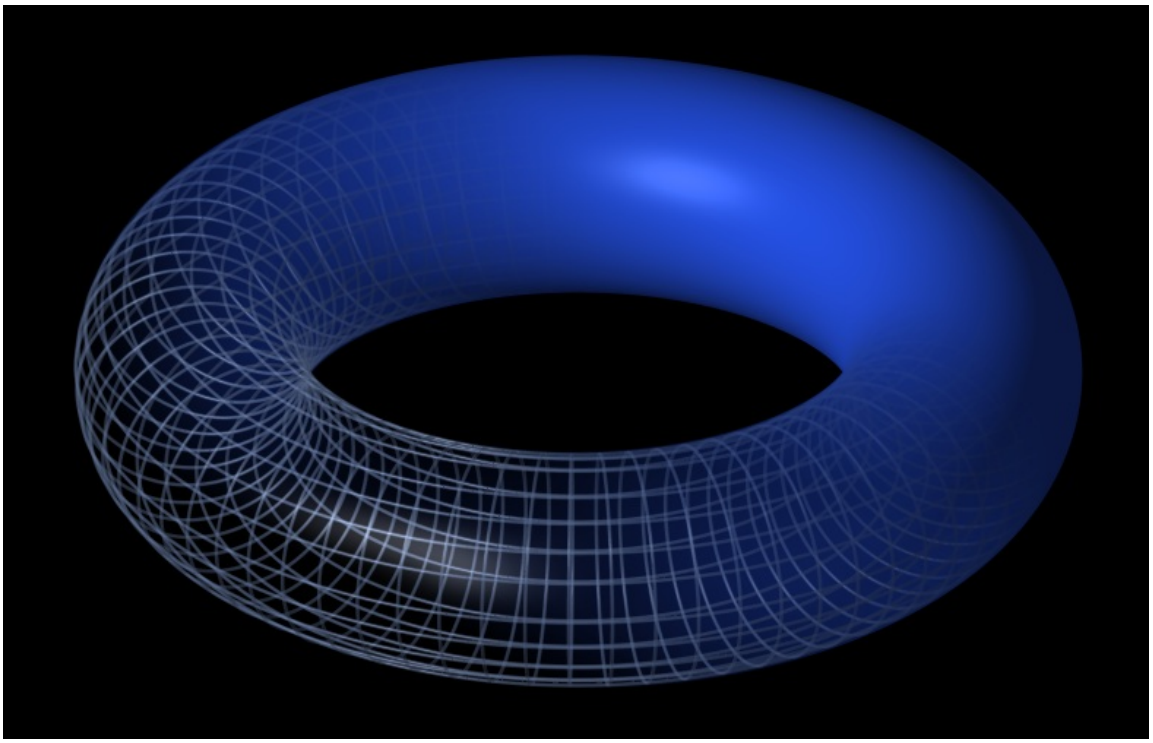
At the trans-planking boundary we find part of that answer when we combine it with the positive energy theory. When we normally attempt to compute the total energy of the ZPF, the large energy of this boundary tends to giver us infinities or we get an answer that is far above what experiment and observation show us. In fact 120 powers too large. But that is because we only can measure part of the circuit in this case. Inside this boundary all the negative energy counter balances this large positive value. What we end up with is actually the value observation shows us. One way of looking at this is via the Higgs(13) mechanism. This mechanism was proposed to account for why particles have the mass/energy they have. It started as a simple math trick to cancel the infinities quantum theory gave us. Later it was assumed there must be actual Higgs bosons that achieve this.

But no one to date has ever been able to detect in a lab a real Higgs Boson. The reason will become clear.

Inside this boundary there is a transition zone between the high positive energy and the high negative energy further inside. Normally one could assume it transitions to zero energy at some point. The outer boundary could then be considered a hollow Schwarzschild sphere with two internal trapped regions. One of negative energy and the other a flat Minkowski region or sheet where $h_{ab}=1$. I choose the value of one for a reason. Instead of being totally flat this region is forced into a stabilized condition where the energy is not zero. It has a forced false vacuum state to it. Its in this state that the higgs field and its bosons exist. We

cannot measure them because they are trapped outside our ability to detect them via any C=1 detection method, except indirectly through the different particle masses they generate(see 14 for a similar vacuum state proposal).

One simple way to model these three regions is as standard 2-Torus subset of R^3. A 2-Torus is homeomorphic to the surface of a doughnut in R^3 and



But, the Lawson Conjecture (also known as the Hsiang-Lawson conjecture) states that any minimally embedded torus in the 3-sphere with the round metric must be a Clifford torus and the Clifford torus is a special kind of torus sitting inside R^4. This object has negative curvature on the internal parallel circle and inner region, positive curvature on the external circle and outer region and zero curvature on the upper and lower parallel circles.

One can also combine the energy signatures of each region to develop a combined metric. That metric matches the original AWD metric in spherical format. This spherical format allows this metric to cause a warp effect in all directions with motion determined by the ship's own motion under a crews direct control instead of the original warp metric which was unidirectional an required the field itself to be in motion. But there is one big difference with this warp metric. Unlike the one proposed by Alcubierre, this metric is natural occurring and well supported by known quantum theory as well as brane theory.

So if one could enlarge the planck scale to envelope a craft one would have solved the first objection about how to generate a warp field. Taken with Fernando's mathematic example of the energy requirement being lower in astronomical terms and this proposal answers at least two objections at once.

But it also solves other objections and provides solutions to other big physics questions.

The next question concerns Natario's issue with warp drive: How do we navigate, and how do we alter velocity and course. For the solution here we need to consider true quantum gravity this modeling exposes in a unique way.
One issue raised by Brane Cosmology modeling is:

Brane Cosmology

- *Brane Cosmologies have their origins in strong coupling limit of $E_8 \times E_8$ heterotic string theory (Horava, Witten).*
- *4-d universe viewed as a hypersurface, or* ***brane****, in a 5-d spacetime called the* ***bulk****.*
- *Standard model particles (open strings) are constrained to the brane and see only 4-d.*
- *Gravity is 5 dimensional.*
- *Differs from Kaluza-Klein models in having a large, non-compact extra dimension.*

The central issue is the third point of the above. However, looking at quantum gravity we find a solution to this.

Einstein's theory of gravitation and inertia has long predicted a carrier particle for the gravimagnetic field. That particle is known as a graviton which is itself a Boson of zero rest mass just like photons. However the difference is photons have a spin value of 1 while gravitons have a spin value of 2 and the first carries the EM field while the later carries the gravimagnetic field. The field equation of gravity is

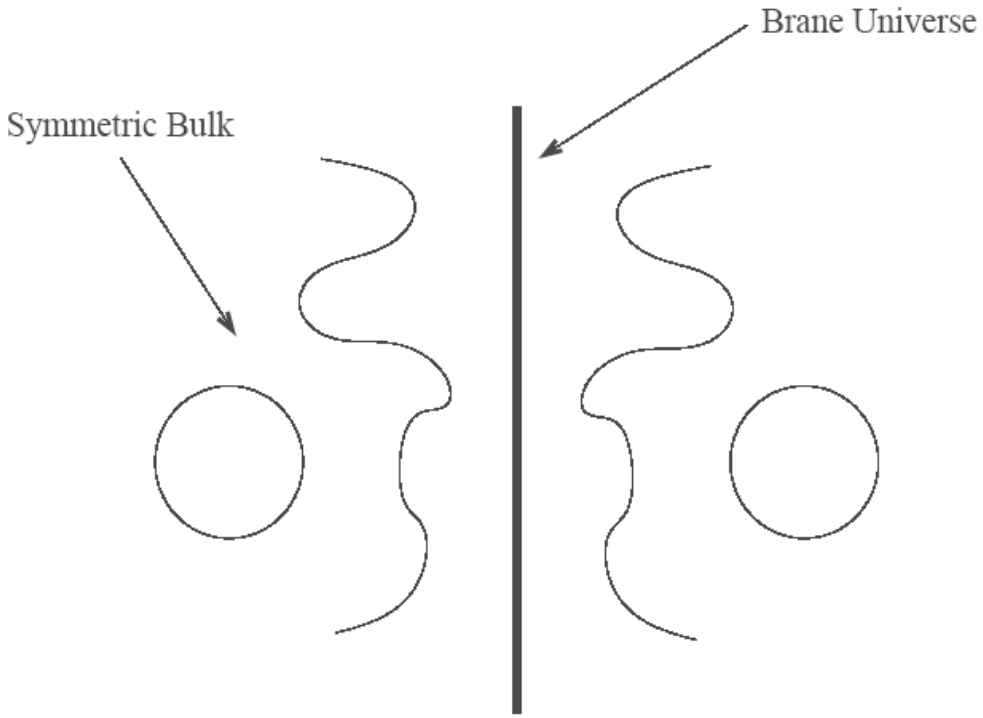
$G_{ab} = 8PT_{ab}$

It is a quadrapole field where as EM is a dipole field. Also EM fields have two charges or polarity. Gravity as we have been able to measure it has only one. The measured difference in strength between the two fields is 1000 fold. Em fields are 1000 times stronger than gravity even though both fields obey the $1/r^2$ rule. To this date no method has ever been found to detect either the individual gravitons or the predicted gravity waves.

What I am going to suggest is the graviton, like the higg's boson is itself trapped in that transplanckian region. But it has two messenger particles, one of which can be detected in our space-time and one that can be detected in hyperspace. These could be termed graviphotons. The way to find the proof of this part of General Relativity is to not search for a gravity wave, or gravitons, but find a photon signal that matches the right frequency of a predicted gravity wave at half the expected amplitude. The reason for half the amplitude is the fact that the source gravimagnetic radiation which is quadrapole only sends out half its signal as normal photons, the rest travel via hyperspace as tachyon like photons. For example, if one takes the alternative metric theory commonly called the Moffat theory, takes

its value for the quadrpole contribution to say the perihelion advance of Mercury and divides it in half one gets a value that is in line with current experimental evidence(15 and 16). But this is not to say it or the Bimetric Rosen theory, where one has dipole gravity radiation is correct. Indeed, under this theory gravitational radiation is still quadrupole. What this translates to is there is no free in anyone space-time quadrapole radiation. It only exists in full strength inside that junction region of both space-times. Inside our space-time we measure gravity with half the circuit as 1000 times weaker than EM. But with the whole circuit the two fields are equal in strength as they share a common untrapped carrier. Mach's principle still holds: Mass there tells space-time here how to move and bend. But there are two carriers, one Advanced and the other Retarded, that you have to measure to fully understand gravity.

If one can detect the signal of gravity one can detect the mass of objects in our path. Not only that but hyperspace is by theory a twin copy of our space-time.

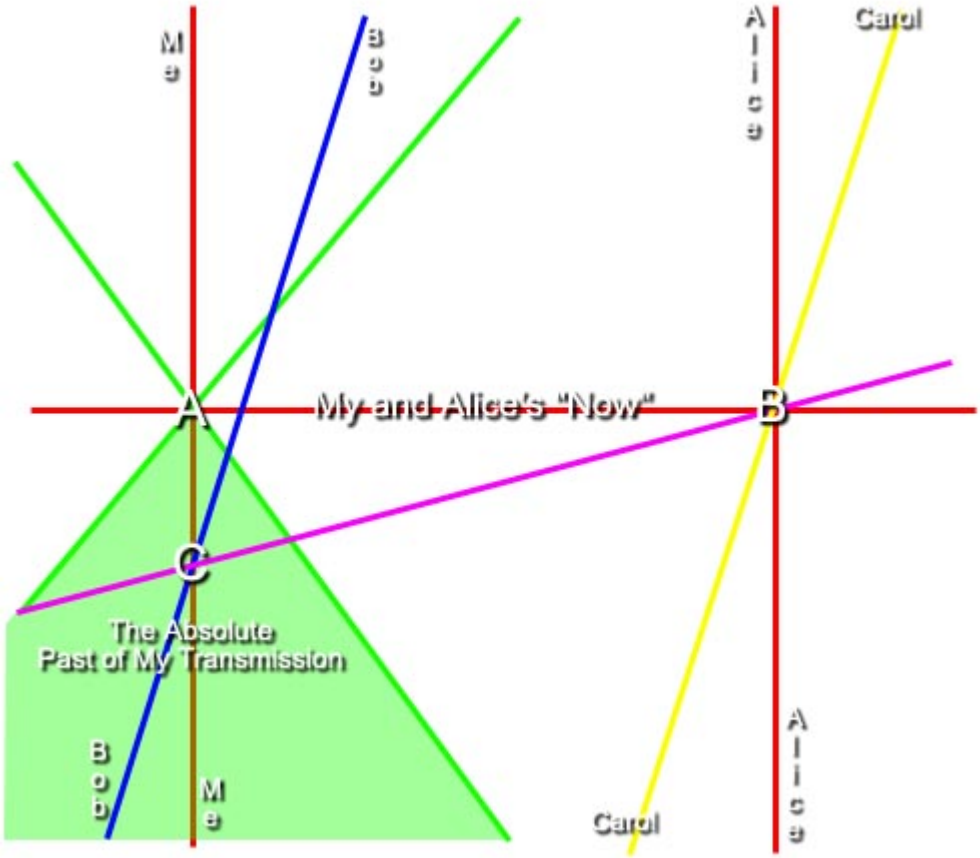


Standard assumption is that the spacetimes either side of the brane are mirror images of each other (Z_2-symmetry).

Its just time moves faster there than in our space-time. That being the case then we also have visual means by which to navigate. Adding this to the fact that it is the craft that generates the field that enlarges the planck scale and the craft providing the thrust that moves this enlarged region Natario's problem is solved.

I'll will also suggest we now have a means to communicate both inside hyperspace and to

someone back on earth. In both cases if the transceivers are inside of hyperspace or a hyperspace bubble their communication speed is the local velocity of light inside of hyperspace.



The pretty much undeniable Problems of Causality Paradoxes in FTL Travel

I arrange for Alice to move out into space, and then assume a position at rest relative to me. Things are arranged so that Alice and I are moving with the same speed, and both are moving in the direction from me towards some further out point directly in front of us. At event A I use a laser to transmit a message to Alice at event B. In a normal space condition Alice and I can be just as vastly separated by appearance as we would in this normal space-time diagram. Yet, at some fundamental level in hyperspace we could actually be sitting in a region that is casually connected because of a differently local value for C. Even though our outside observable lightcones are separated, they in this special frame of reference would be connected. So, in essence, by using this alternative frame of reference I could signal Alice even though a normal space-time light pulse I sent would not reach her in the same amount of time. From those of us in say Bob's or even a further away position there would be no way for a signal to reach there. Yet, if we could view things at the hyperspace frame we'd realize that all these reference frames are interconnected.

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For that figure we must do some rather simply math figuring based first on the planck

boundary vacuum expectation value and its escape velocity figure minus the higg's field value. In fact, one could actually ignore that last part for a good approximation. Try C^3 for a good approximation. That's about what the actual value for C is inside of hyperspace.

Based upon that thrust value that in our space-time produce a given velocity in this vacuum will produce a velocity in hyperspace that is raised to the third power. If we could generate here a thrust that allows a craft to move at say 100 miles per second, inside hyperspace that same thrust would let the same craft travel at 1000000 miles per second or 5.36 C(see Author note 5). I would suggest that a matter/anti-matter propulsion system could achieve at least that much thrust. That translates to Warp velocity being possible with a few simple advances forward in conventional propulsion systems. With Ion drive we currently can achieve about 10 miles per second velocity which in hyperspace would allow us to move at 1000 miles per second.

Another aspect this theory could help explain is the observed accelerated expansion of the cosmos. Close tied to this is the Dark matter issue and also the Pioneer Probe is known to have a slight slowing in its velocity as it has proceeded out of our solar system(16). Actually, there have been other probes that confirm this slowdown. However, NASA uses on more modern probes spin correction which they admit has a noise factor that makes it impossible to confirm the effect via even more recent probes.

If we assume there could exist a natural method within which the Planck scale varies then one effect that would be present and detectable within our space-time would be its mass/energy leaving a gravitational red shift or blue shift signature even though visually there would be no other evidence of its presence. The Pioneer probe signals show an 8 meter per second velocity slowdown with an absolute Sunward pointing vector.

Whatever causes this has its source in the Sun and displays itself measurably past a certain point of distance from the Sun. Its cause must, following Fernando's hyper drive findings, be a positive energy field or particle that the Sun admits. This translates to the planck scale size being smaller here than outside of the system. If we follow the logic here then all stars probably produce this effect. That effect, while not an actual change of the local velocity of light, but rather, a gravitational red shift similar to that encounter say by an object falling into a gravity well like a black hole on a smaller scale would the further out in the universe one observes have its pointing vector change and eventually line up with the CMB itself. At that point we'd no longer see it as a red shift. It would now show up as a blue shift making it seem like the expansion rate had increased with time even though the actual rate had never varied from that normally predicted.

At the same time, each region where the Planck scale was larger would gravitational effect other regions around it. Because we cannot directly observe these enlarged regions we'd assume there was extra mass present. So based upon this there is observational evidence that tends to support this revised gravitational theory and the PV model of a variable Planck scale. It also confirms Fernando's predicted local brane lensing effect on a different scale.

What kind of RS brane model does this actually support. I would suggest there is strong indication in this that we live in a RS triple 3-brane universe with our brane caught between. Our brane, plus hyperspace makes up 8 dimensions when you take each as a mirror image of the other with different values for C. The outer third brane does not seem to have a velocity

of light that we can at present measure any effects from. It literally acts like a shell of very dense matter/energy fitting the properties of a spherically symmetric Schwarzchild shell with 3 dimensions only and non-rotating(author's note 1) with the inside space-time we live in being very close to a perfect Minkowski metric h_{ab} irrespective of how much combined mass/energy density there actually is in our space-time.

This combined with the solution to the Dark matter problem would well explain why we seem to exist in an FRW type universe where k=0 even though most attempted measurements of mass/energy density would suggest the value should be less than 0 and most Big Bang modeling with or without inflation has always suggested that without a cosmological constant the universe should have collapsed. This translates to both models being a bit off.

This does however leave a few problems unsolved. The spherical shell could, given our vacuum's low and positive energy density be explained itself along positive energy theory respects if we assume there exists outside of it a higher energy system, perhaps the false vacuum we sprang from. This would tend to support the baby universe ideas proposed by others. It's character would also explain why the universe acts very much like a giant holograph. We are literally inside the cosmos' huge version of a holographic information storage medium.

My normal assumption even without exact dark matter/gravity figures for the whole cosmos tend towards the idea that eventually our universe will collapse in a big crunch which perhaps starts a recycle effect. However, the outer shell, based upon the logic of Mach's principle where matter there from any perspective tells space-time here how to bend would itself have to shrink. This would in turn imply it undergoes its own version of Hawking radiation into that false vacuum state. This would tend to suggest our universe is a onetime event where collapse means every bit of energy here returns to the false vacuum from which it sprang in the first place. That makes for a neat tidy physics situation. But from the perspective of life forms in the universe its not good news.

The only thing I can say for sure is the Boundary, that third brane really even though under the normal boundary of the boundary principle the outside is a zero as far as the math is concerned has a history tied directly to our own. It's fate is our fate. Einstein would have loved the way the universe obeys Mach's principle. But he probably would have asked if God would create something simply destined to vanish. However, he'd have loved the way chance rolls of the dice tended to vanish from the equation when you look at the big picture.

Its been asked how much real evidence favors multidimensional theories? I've used simple quantum theory to come to the same basic model. If quantum theory is correct then we do live in a universe with more than 4 dimensions. That being the case I would suggest the natural origin of the dark matter effect does relate to supersymmetry.

The simplest answer if one removes all other possible answers is usually the correct one. The simplest answer from supersymmetry is the stable gravitinos. They alone have the ability to increase or decrease gravity of all the known particle states. They occur from the decay of exotic neutrinos into selectrons which in turn decay to them. This would also explain the missing neutrino problem itself.

There is also some modern brane theory related to the Israel junction condition behind the neutrino idea. The governing of curvature is determined by the Israel Condition

$\Delta K_{\alpha\beta} = 8\Pi[T_{\alpha\beta} - 1/3 h_{\alpha\beta} T]$

Where $T_{\alpha\beta}$ includes both the brane tension and the fields living on the brane. The brane tension is governed by the discontinuity in the slope of the warp factor of the brane.

$ds^2 = e^{-2\mu y}\eta_{\mu\nu} dx^{\mu} dx^{\nu} + dy^2$

is the usual five dimensional metric when $T_{\alpha\beta} = 0$. If one follows the double brane approach our brane has negative tension and the hidden bulk has positive tension.

If one follows the standard path of supersymmetry there is a restriction on the brane tensions that must obey the following:

$|T_{0,\Pi}| = T$

where T is the fine tuned tension related to the five dimensional Plank Mass by

$T = 6M^3_5 k.$

When this bound is satisfied the full bulk brane theory remains invariant under five dimensional N=2 supersymmetry, and restricted to four dimensional N=1 supersymmetry on the branes themselves. However, with Fernando's PV type modeling of the Dutch equation involved in the Planck scale and also it's mass this whole issue becomes a variable that no longer is forced to obey the tension restriction. I suspect the key is in modifying the slope of the warp factor itself. Thus,

$ds^2 = e^{-2\mu y}\eta_{\mu\nu} dx^{\mu} dx^{\nu} + dy^2$

Becomes an equation of interest which is controlled by

$\Delta K_{\alpha\beta} = 8\Pi[T_{\alpha\beta} - 1/3 h_{\alpha\beta} T]$

or the Israel Junction Condition as it is referenced as.

I had followed the path of the missing neutrino issue because:

The effect of the black hole charge on the brane arises via the junction conditions and leads to the modified Friedmann equation

$$H^2 = \frac{\kappa^2}{3}\rho\left(1+\frac{\rho}{2\lambda}\right)+\frac{m}{a^4}-\frac{q^2}{a^6}+\frac{1}{3}\Lambda-\frac{K}{a^2}. \qquad (225)$$

The field lines that terminate on the brane imprint on the brane an effective negative energy density $-3q^2/(\kappa^2 a^6)$, which redshifts like stiff matter ($w=1$).

This is what I suspect the gravitno's do as their field decreases following a 1/r^2 rule.

However, we should be able to duplicate this effect through other sources. The problem is finding a field that can duplicate this effect. If one particle in nature can do this then a field with similar properties ought to be able to be generated.

However, it is not a solution of how to generate Fernando's hyperspace field. The entire solar output only yields a local 8 meter per second effect. Something else is needed for his field to work. In fact, that output more just effects the local brane lensing to that the vacuum takes on a different local value for C, following PV ideas.

That something else is within a fully worked out version of his field equations which is not the purpose of this article at all. That something else if past history in this research is any indicator will have it's own set of problems to over come. I would suggest is start there and keep a constant reference in the book: Gravitation and Inertia by Ciufolini and Wheeler from the Princeton series in Physics along with any good book on quantum theory.

Even if you work all this out you are still a long way from any Warp five type crafts. But you could at least step out in a 2 year mission and visit the nearest system to our own. That would be another small step for man and a giant leap for mankind.

I titled this article with an interesting title that comes from both early and modern names for Zephram Cochran's warp drive in Star Trek fantasy. But in reality what Fernando suggest is real warp drive of the Star Trek type It is displacing the mass of a craft into an alternate or sub-space-time who's properties match that of the original AWD metric and that has a velocity multiplication factor very much akin to the SF show's one. It comes complete with warp communication methods, warp navigation solutions, etc. But neither the Great Bird of the Galaxy, nor even Alcubierre gave you the total road map. Both did an excellent job of simply suggesting a way.

To quote Steven Hawkins on the set of STNG when he saw the warp core I'm working on that. There are a lot of us still out here doing just that. All the approaches have merit. But leap a bit beyond all the metrics and think more about how to make the field work.

In general if I was to suggest a possible viable path there are now more articles supporting wormholes of varying types than any warp drive based metric. Some even require little or no exotic energy.

Nature has solutions in the simplest way. Keep it simple stupid fits all real research methods.

Your's Paul Karl Hoiland.

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