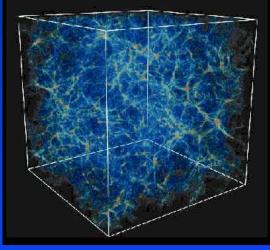
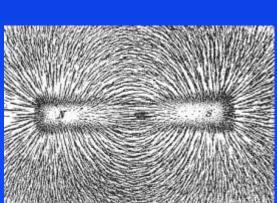
Tri-Space: A Model of Spacetime and the Universe



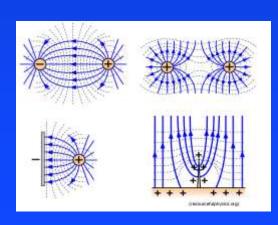
Gregory V. Meholic

Greg.Meholic@aero.org orionstar2209@yahoo.com



Estes Park Workshop on Advanced Propulsion Estes Park, Colorado

September 10-14, 2018



Discussion Topics

- Caveats and Ground Rules
- Key Concepts (3)
- > The Luminal Interface
- Conjectures on Superluminal Mass
- Conjectures on Superluminal Space
- > Trans-Space Dynamics
- > Phenomena Explainable by Tri-Space
 - Trans-Space Method FTL Travel
 - Gravity and Inertia
 - Charge, Magnetism, Photons and EM
 - Dark Matter and Dark Energy
 - Black Holes
- > Tri-Space Comments
- Possible Predictions
- Potential Experiments and Research
- Concluding Information

Caveats and "Ground Rules"

- I am not a physicist, astrophysicist, cosmologist, quantum physicist or mathematician. Just an engineer.
- > The ideas presented are <u>conceptual</u>, <u>notional models</u> of the <u>natural world supported by logical</u>, <u>scientific extensions of well-known physics</u> (GR & SR), cosmological observations, and present <u>understanding of quantum mechanics</u>.
 - Key evidence that supports or refutes the ideas may have been overlooked – please let me know!
- Where applicable, visual and <u>graphical analogs</u> will attempt to convey complex ideas without the use of mathematics or equations.
 - Based solely on conjecture, implication, inference and supposition ("if X is true then..."; "since that's possible, what if..."; "yeah, but...")
 - No transformations, no tensors, no reference frames, no Lagrangians, no space warps - sorry!
- The Tri-Space ideas presented are intended to offer a different perspective of looking at the 'answers'.
 - Not intended to invalidate, challenge or refute 'currently-accepted', experimentally-validated theories.
- As always, all proposed ideas are "works in progress..."

Genesis of the Concepts

> 1989: Inadvertent discovery of the report below in the library of Embry-Riddle Aeronautical University:

FASTER-THAN-LIGHT PARTICLES: TACHYON CHARACTERISTICS Edward A. Puscher October 1980 N-1530-AF Prepared For The United States Air Force

CHARACTERISTICS

SUMMARY

This Note documents an analytical prediction of some of the characteristics which presently undiscovered faster-than-light sub-atomic particles (called tachyons) must possess if they are to exist without violating the Theory of Special Relativity. A brief review of necessary concepts from the Special Theory is included so that the reader might more readily understand the reasoning as it is developed. Necessary, but not all, characteristics of tachyons are then identified and presented. Finally, an interesting potential relationship between tachyons and anti-gravity is discussed.

- After reading many, many (many) times, ideas began to take shape.
- What is presented here is the culmination of 29 years of 'thinking'.
 - Unfortunately, that's all no math, no experiments @

Key Concept 1: Relativistic Symmetry (1)

- > The first key concept describes the realms that exist in the Tri-Space model of the universe.
- > To start with, Puscher combines two equations of Special Relativity to produce the following relationship of mass, energy and velocity:

First,
$$m = \frac{m_o}{\sqrt{\left(n\right)^2}}$$

put
$$m = \frac{m_o}{\sqrt{1 - \left(\frac{v}{c}\right)^2}}$$
 into $E = m_o c^2$ and get $E = \frac{m_o c^2}{\sqrt{1 - \left(\frac{v}{c}\right)^2}}$

into
$$E = m_o c^2$$

$$E = \frac{m_o c^2}{\sqrt{1 - \left(\frac{v}{c}\right)^2}}$$

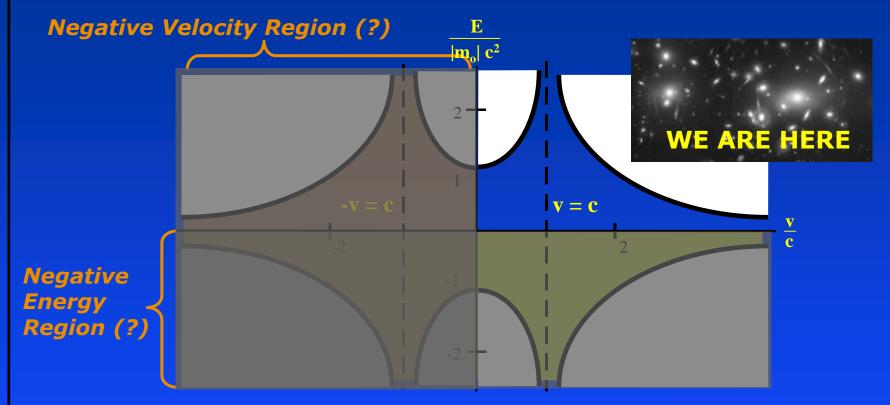
Then, normalize with respect to velocity and get:

$$\frac{E}{|m_o|c^2} = \frac{1}{\pm \sqrt{1 - \left(\frac{v}{c}\right)^2}}$$

Plot the results...



KC1: Relativistic Symmetry (2)



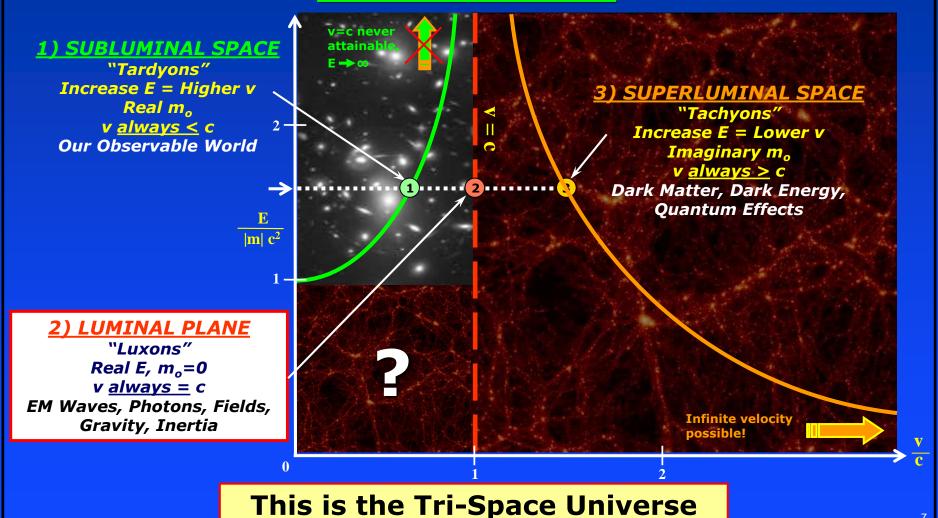
- Only the upper-right quadrant represents the our current understanding of physics and nature.
 - "Negative" velocities are often a matter of convention, but "negative" energies are not well understood.

Figure from Puscher, E. A., "Faster-than-Light Particles: A Review of Tachyon Characteristics," Paper N-1530-AF, Rand Corporation, Santa Monica, CA, 1980.

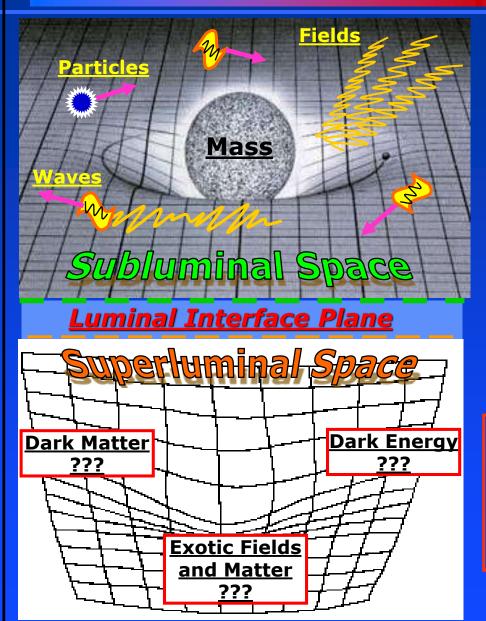
KC1: The Tri-Space Universe: General

For a given absolute energy, E, <u>at any point in space</u>, *three* sets of physical laws simultaneously exist, each defining a unique spatial realm.

What does this mean?



KC1: The Tri-Space Universe: 2-D Model



- Tri-Space can be graphically represented as three, parallel realms that co-exist at every point in space.
- The Luminal Interface physically separates sub and superluminal spaces. It is also known by familiar terms such as:
 Zero-Point Field (ZPF)
 Quantum Foam
 Physical Vacuum
 Quantum Vacuum

Tri-Space consists of TWO <u>spacetimes</u> bounded by an interface "surface".

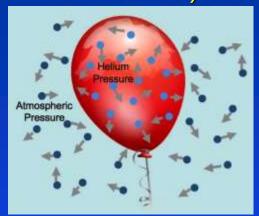
It is a 2-D representation of a 3-D universe.

Key Concept 2: Fluidic Spacetime (1)

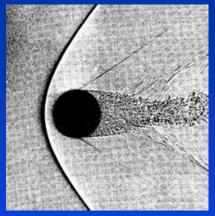
- Tri-Space proposes that spacetime can be equated to a fluid-like medium and has properties analogous to those of a fluid.
 - This concept was formally known as the 'luminiferous aether'
- In general, spacetime...
 - ...is everywhere and has the same qualities between galaxies as it does between atoms;
 - It occupies ALL volumes at any scale pure "vacuum" does not exist
 - ...is composed of point-like constituent entities;
 - These are the fundamental building blocks of EVERYTHING
 - Planck scale or smaller
 - ...makes up ALL mass, ALL energy, ALL fields, and is the transmission medium for ALL interactions or couplings of these things;
 - ...has different "phases" or "states" which ultimately manifest as each of the three realms in Tri-Space.
 - Triple point, critical point, other point unique to spacetime?

KC2: Fluidic Spacetime (2)

- Spacetime exerts *pressure* upon a discontinuity.
 - Term is widely used in physics, esp. in ZPF and Casimir studies.



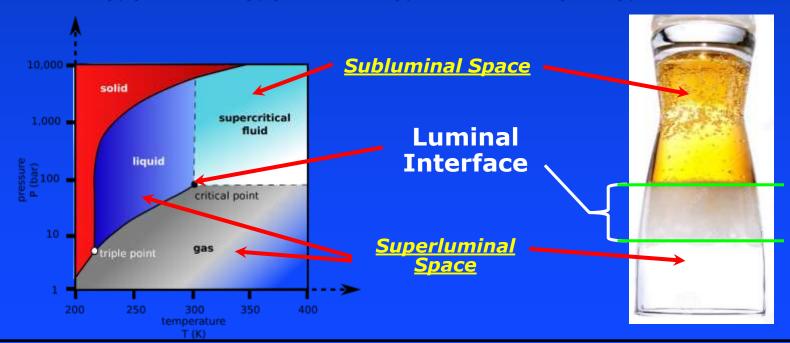




- Spacetime is easily distorted and displaced by the motion of mass.
 - Models the <u>effects of</u> gravity and inertia
- Spacetime has density and compressibility.
 - Resists changes in volume. Widely used to characterize fields and ZPF. Can be "squeezed"
 - Density and energy content are different inside a mass
- Spacetime has viscosity and viscoelastic qualities.
 - Offers resistance to "flow". Strives to return to some reference state
 - Solely responsible for <u>causes of</u> gravity and inertia.
- Boundary layers and vorticity exist in spacetime.
 - "Frame dragging" / Lense-Thirring effects

KC2: Phases of Spacetime

- Tri-Space proposes that different 'phases' of spacetime exist based on its fluidic nature, each giving rise to a particular space:
 - Subluminal space = High pressure, 'supercritical' phase
 - **Superluminal space** = Low pressure, 'subcritical' phase
 - Luminal interface = Critically damped, 'superfluid'-like??
- Spacetime may have a 'triple-point'-like behavior.
 - May determine which space in which mass energy can exist
- What parameters determine the spacetime phase? Who knows...
 - Density, permittivity, permeability, resonant frequency, ??



Key Concept 3: Spacetime Constituents

- R. Gauthier (2018) has come up with a model of both the photon and electron (and other particles) based on the existence of an entity called the Superluminal Energy Quantum (SEQ).
- Below are screenshots of from his most recent presentation building on similar concepts dating back to 2002.

Entangled Double-Helix Superluminal Photon Model Defined by Fine Structure Constant Has Inertial Mass $M=E/c^2$

and

Quantum-Vortex Electron and Positron Formed From Superluminal Double-Helix Photon in Electron-Positron Pair Production

Richard Gauthier
Department of Chemistry and Physics
Santa Rosa Junior College
Santa Rosa, California, USA
https://richardgauthier.academia.edu/research
Vigier 11 Conference, Liege , Belgium
August 6, 2018

The Double-Helix Photon Model

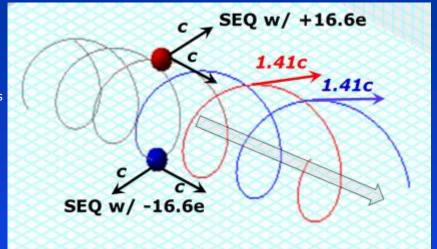
The double-helix photon model is composed of two oppositely charged superluminal energy quantum particles moving in a double-helical trajectory.

The energy quanta are held in the double-helical trajectory by the Coulomb attractive force between the two superluminal energy quanta of electric charge Q and -Q separated by the helical diameter D.

KC3: SEQ Photons and Electrons

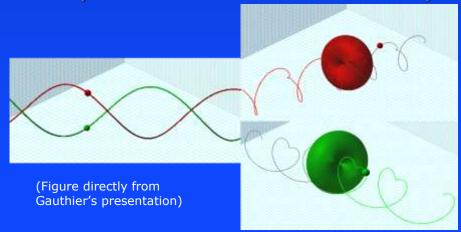
Sauthier shows that the SEQ double-helix model of the photon can satisfy the photon's charge neutrality, spin, momentum, frequency and wavelength.

(Figure directly from Gauthier's presentation. Arrows and text added by me)



The SEQ is <u>naturally</u> superluminal $(c\sqrt{2})$

He also shows that the quantum-entangled SEQs of the photon can be separated to form an electron-positron pair.



-1e Electron

The SEQ of both particles trace a closed path on the surface of a horn torus.

+1e Positron

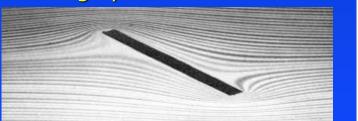
Matches the measured spin, charge, vibration, mass and radius.

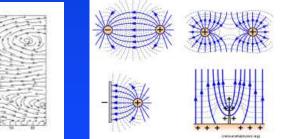
KC3: SEQs are EVERYWHERE

- If the Gauthier SEQ model can be validated on other particles, it would imply that ALL matter and EM waves are fundamentally based on superluminal motion.
- This then infers that the SEQ is the fundamental particle of the spacetime medium and thus of ALL known phenomena in the Tri-Space universe. It would also support the existence of Superluminal space and its coupling to mass.
- SEQs are <u>EVERYWHERE</u> and massless, but they can give rise to gravitational mass (Gauthier electron)
- SEQs dynamically interact and influence the orientation and direction of one another through 'viscous', fluidic processes.

This creates charge fields, magnetic fields, gravity and the force induction

through particle motion





<u>Mass, charge, magnetism, photons, EM waves and other exotic</u> <u>fields</u> can be graphically modeled as <u>fluid-like phenomena</u> in all three Tri-Space realms based on the <u>orientation and paths</u> of SEQs.

The Luminal Interface

- The Luminal Interface between spaces can be modeled as a surface that supports ALL mass, EM energies, waves and particles.
 - Surface permittivity, permeability determine speed of light, c
 - Exhibits a surface tension-like quality ("quantum gravity" for small masses)
 - Acts like a meniscus between spaces and around masses.
- The interface has a thickness that has fluidic properties different from either space.
 - Certain SEQ energy states may be "filtered" between spaces (Gauthier photon & electron)
 - This is a key concept for Tri-Space models of gravity and inertia
- SEQs can travel along the sub- or superluminal interface boundaries or through the interface thickness.
 - This is a key concept for Tri-Space models of charge and magnetism
- Mass energy cannot pass between spaces through the Luminal Interface, but gravitational energy can.
 - This preserves the conservation of mass and energy within Tri-Space even though it would appear to violate it locally
 - Exchange mechanisms are believed to exist!

Conjectures Regarding Superluminal Mass

Puscher outlines the "Tachyon Characteristics" which govern the nature of mass (tachyons) in superluminal space:

(1)	Must have imaginary rest mass
(2)	Always travel faster than light
(3)	Could have either \bigcirc or \oplus relativistic mass $\binom{m^i}{v}$
(4)	Will have real energy
(5)	Energy may be either ⊕ or ⊙
(6)	Energy could be either \oplus or \bigcirc and still have \oplus momentum
	Energy could be either \oplus or \ominus and still have \ominus momentum
(7)	Must have imaginary "proper length"
(8)	Must have imaginary "proper lifetime"
(9)	Adding \oplus real energy would slow down the \oplus energy tachyons
(10)	Adding \odot real energy would slow down the \odot energy tachyons
(11)	May have infinite speeds
(12)	Infinitely fast tachyons have zero energy

(13) Infinitely fast tachyons still have momentum

- (14) Real energy could be measured (either \oplus or \odot) by an observer in an s' frame moving fast WRT s frame, but at w < c.
- (15) There are many s' frames where an energy which appears ⊕ to an observer in the rest frame s would appear as ⊙ to the observer in s'.
- (17) Time reversal will occur whenever (15) or (16) occurs. (whenever $wv > c^2$)
- (18) Tachyons which have ⊕ (or ⊕) energy can also appear to SAME observer to be going backward in time. (but not necessary)
- (19) Objects made of tachyons would appear to have \bigcirc length unless \bigcirc $\sqrt{}$ is used.
- (20) Objects made of tachyons would appear to have time reversal unless ⊙ √
- (21) Since entropy must increase, tachyons would appear to violate 2nd Law of Thermo except for time reversal occurs at same time, ie, entropy decreases are accompanied by time reversal. (natural occurrences tend to go from higher ordered systems to lower ordered systems - low ordered systems have low entropy).

Fig. 16--Tachyon characteristics

Superluminal particles can have <u>real (+) mass, real energy, real</u> <u>momentum and travel forward in time</u> (as long as not at v=c). Mass can exist in superluminal space!

> Based on these inferences, additional characteristics of the superluminal realm can be deduced.

Conjectures Regarding Superluminal Space

- ALL velocities are always greater than c. (This is normal!)
- Based on <u>imaginary</u> proper mass and <u>real</u> 'observable' mass, Superluminal relativity proposes that relativistic effects become significant as velocity decreases towards the "rest" state of c.
 - Effects are opposite except for time (mass decrease, length extension)
 - Is this right?
- As energy, E, decreases, velocity increases.
 - Are infinite velocities possible? How low can E go?
- EM energies exist at the unattainable state of v=c, so photons and EM waves could be viewed as "stationary" from superluminal space.
 - What exactly does this mean?
 - Can photons/EM emitted in superluminal space be observed?
 - How does this affect detectors, guidance/navigation sensors, etc.?
 - Could these EM energies be acted upon for propulsion?
- The large velocities of superluminal mass implies that, for a given energy state, superluminal mass occupies an immense physical space (possibly of galactic proportions) compared to subluminal mass in order to satisfy the v>c criteria between tachyonic particles.
 - Is this right?
- What else????

Trans-Space Dynamics

- The Tri-Space Universe is a vast continuum of SEQs. Each SEQ can follow three distinct sets of physical laws depending on the environment.
 - **SEQs are massless** under ALL conditions, and thus DO NOT experience relativity or casuality
- Sub- and superluminal spaces co-exist and are separated by the Luminal Interface plane.
- Mass energy follows the <u>Trans-Space Mass-Energy Relation:</u>
 - Both mass <u>and</u> gravitational energy are theoretically interchangeable between spaces, thus conserving energy and momentum in Tri-Space
- Quantum state of matter and spacetime determines in which space mass exists (quarks and photons may be able to freely 'jump' between spaces).
- Gravity is the only currently detectable phenomenon that can be observed and felt in both spaces simultaneously.
 - Gravity attracts mass in same space, but repels mass in adjacent space
 - Gravitational energy may or may not be detectable in the adjacent space
- > Time proceeds forward and concurrently in BOTH spaces.
 - As long as not close to v=c line

Recap of Tri-Space Basics

- Key Concept 1: The Tri-Space universe is two spacetimes separated by a Luminal Interface that has a 'thickness'.
- <u>Key Concept 2:</u> Spacetime, masses and fields are fluidic phenomena with both sub- and superluminal components.
- > Key Concept 3: **SEQs** are the fundamental constituent of spacetime
- Everything is made of SEQs or is a resultant of some fluid-like interaction thereof.
- Superluminal mass has <u>imaginary</u> proper states, but <u>real</u> observable (relativistic) states.
- Gravity is the only currently detectable phenomenon that can be observed in both spaces simultaneously.
 - Gravity attracts mass in same space, but repels mass in adjacent space.
- Mass energy follows the <u>Trans-Space Mass-Energy Relation:</u>
 - Mass and gravitational energy are theoretically interchangeable between spaces, thus conserving energy and momentum in Tri-Space.



What Else Can Tri-Space Possibly Explain?

The Tri-Space Universe Model can provide consistent and viable explanations for the following:

- // Faster-than-Light motion/travel*
- ∠ Charge, magnetism, photons, EM*

- ✓ Special Relativity (mass incr., time dil, length contr.)
- Zero-Point Field (ZFP) energy and quantum vacuum
- Gravitons/Gravity waves
- String theory
- Quantum behavior
- Tachyon particles
- ...and MANY more!!





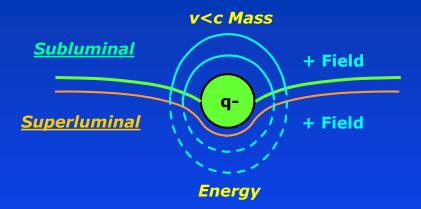
Expansion Epergy

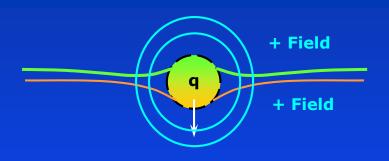
Surface Tension

Trans-Space FTL Travel (1)

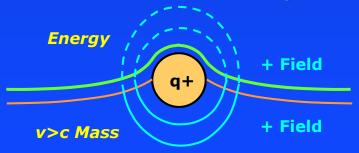
How can Tri-Space allow for FTL travel?

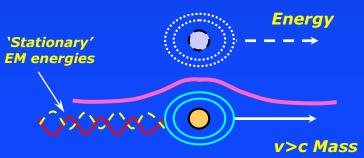
- 1) Create a "field" to force subluminal mass of initial quantum state, q, into superluminal space.
- 2) Process converts superluminal energy into mass and subluminal mass into energy.





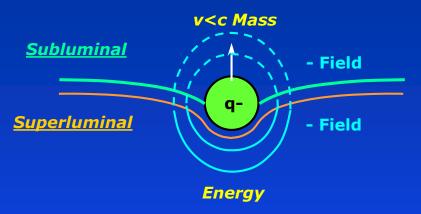
3) Superluminal mass can now travel FTL in superluminal space by field interaction with "stationary" EM radiation.





Trans-Space FTL Travel (2)

4) When the destination is reached, the field reverses polarity to force superluminal mass quantum state back into subluminal space.

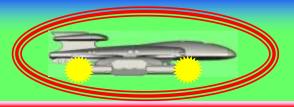


Vessel <u>traverses</u> subluminal space while <u>traveling through</u> superluminal space

- Conversion of mass and energy between sub- and superluminal spaces at the quantum level, <u>OR</u>
- Create a 'bubble' of subluminal space that can exists in superluminal space, <u>OR...??????</u>
- These are only proposed processes for switching spaces and certainly may not be the only way.

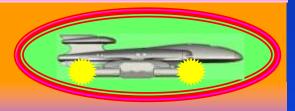
Tri-Space and Trans-Space FTL Travel

Trans-Space FTL Travel: Traverse subluminal space by <u>traveling through</u> superluminal space.



Subluminal Space (v<c)

Luminal Plane (v=c)



Superluminal Space (v>c)

Pros:

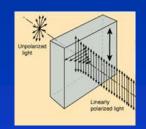
- Velocities <u>always</u> greater than light speed (theoretical infinite velocity)
- No relativistic effects. Causality or relativity not violated in either space
- Navigation possible
- No negative matter required
- Some plausible theories exist for entering superluminal space

Cons:

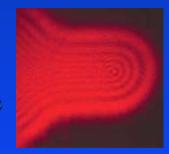
- Assumes existence of superluminal space (possibly dark matter/energy)
- Mathematics partially understood, requires analysis of fluidic space-time
- Characteristics of superluminal space need to be understood
- Difficult to model in 3-D

"How To"s for Mass Transition Between Spaces

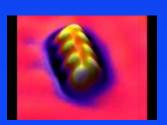
- Three possible ways to explore transition of mass between sub- and superluminal spaces:
- 1. Change the quantum state of mass energy.
 - Must first understand quantum state of subluminal mass and superluminal quantum physics at SEQ scales.



- 2. Switch the phase and group wave function identities of matter.
 - Subluminal mass has STL group velocity, giving rise to mass, and FTL phase velocity.
 - "Rotate" these wave functions about the luminal plane so that group velocity becomes FTL and phase velocity becomes STL.
 - Proposed by D. Froning; several papers available.



- 3. Exploit the sub- and superluminal nature of the matter.
 - Explore how SEQs can make up other massive particles similar to the Gauthier electron.
 - Characterize the fluidic properties of SEQs within complex mass systems (atoms, lattices, etc.)
 - Negative mass may be created by switching SEQ velocities profile



Comparison to Other FTL Concepts

Trans-Space FTL Travel has many advantages over other FTL concepts...

Trans-Space FTL Travel

Other FTL Travel Concepts

Basic Concept

Mass

Energy

Time

Navigation/ Control

Other

Matter energy transferred from one space to another through spacetime medium

Vessel traverses *subluminal* space by traveling through *superluminal* space

- Absolute throughout tri-space
- Conserved between all spaces
- No causality effects
- Time travel not possible
- Possible in superluminal space (similar to subluminal space)
- Detection/Interaction using gravity wells
- 'Stationary' EM energies for attitude control
- No 'negative' quantities required
- Transition to FTL state at subatomic level
- No initial velocity required to transition

- Disturbance created in spacetime via holes, warps, folds, etc.
- Access to multi-dimensional spaces/branes

Vessel travels through holes, warps, folds, or hidden dimensions in spacetime

- Large amounts required
- 'Negative' energy required (?)
- Sometimes instantaneous no causal effects
- 'Negative' energy may pose temporal issues
- Unknown, difficult or impossible
- Destination must sometimes be known beforehand
- No guarantee of FTL velocities
- Quantum effects not defined
- "Brute force" to get to near-c velocities

Gravity in Tri-Space

- Tri-Space models gravity and inertia as resultant reactions of spacetime to the presence of mass.
- Inertia analogous to Wheeler-Feynman absorber theory, but without EM
 When sufficient mass exists in a local region, it will distort and displace the luminal plane, thereby creating two gravity fields:
 - The Primary gravity well is from spacetime <u>displacement</u>.
 - The Secondary gravity field is the resultant <u>curvature</u> spacetime.
- Gravity and inertial forces rely on the fluidic properties of the bulk and the viscoelasticity of the spacetime surface.
 - Gravity can be felt at distances far greater than those of charge and magnetism even though its overall energy is quite weak.
 - Minimally affected by individual SEQs unlike like charge and magnetism.
- SEQ density will change around a gravitational mass.
 - This changes spacetime viscosity, pressure, surface tension, and the characteristics of other fields.
 Secondary distortion:

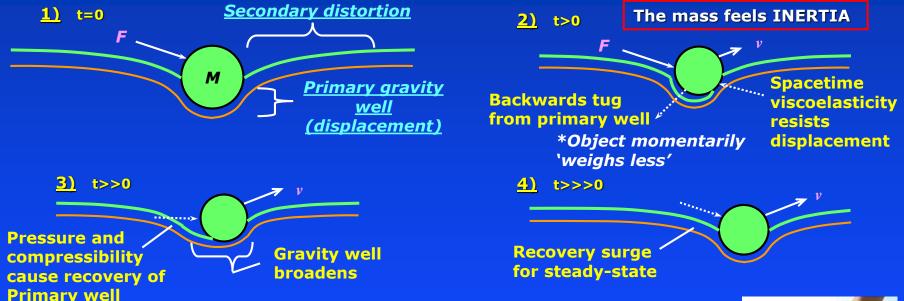
Fluid-like "meniscus"
G constant
Observed all the time

Reference flatness Observed all the time Primary gravity well (displacement): "Thins out" surface around a mass Only observed during acceleration

Inertia in Tri-Space

- Spacetime's quasi-fluidic properties, as well as its viscous resistance, yield a "time lag" for it to react to the change in position of a mass.
- Inertia is a purely *local*, *spacetime phenomenon* and is independent of distant masses, the ZPF, other gravity sources and EM fields.

BASIC ACCELERATION



Inertia is resultant effect when an object "climbs" out of its own **primary** gravity well and is generated when spacetime resists changes in its topology.

There can be gravity without inertia, but there can be **no inertia** without gravity.



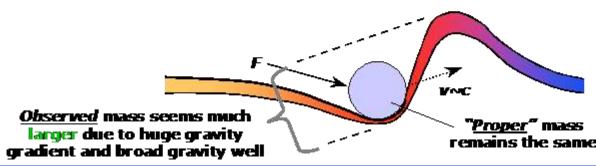
Small and Near-c Mass Effects on Spacetime

Other Inertia-Related Physics

- What about inertia for small (atomic-scale) masses?
 - The smaller the mass, the shallower the primary gravity well.
 - Atomic-scale masses do not experience inertia since they have no primary well - they are only "floating" on the spacetime surface.
 - // This allows them to experience tremendous accelerations
 without affecting the underlying spacetime medium.

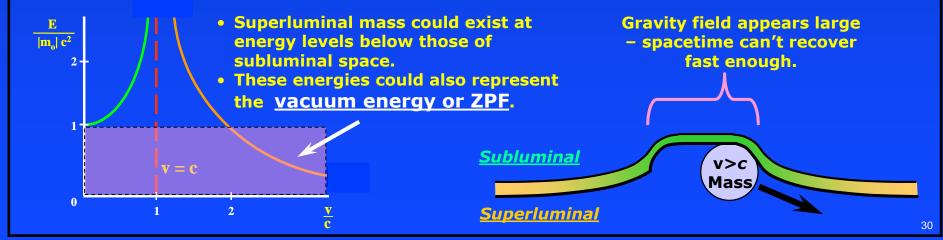


- What about Special Relativity?
 - \angle At v~c, the body creates a standing wave of spacetime in the path ahead responsible for relativistic mass increase.
 - Constant thrust may be required to maintain such speeds in order to overcome spacetime fluidics.



Gravitational Fields in Superluminal Space

- Superluminal mass may exist at energy states below those attainable in subluminal space.
 - Such masses may be too deep within the superluminal realm to produce a detectable gravitational effect on the luminal plane.
 - How would such masses be detected (from either space)?
- If a gravitational effect were produced, the superluminal velocity of the mass creating the field may be greater than the recovery "speed" of luminal spacetime to the perturbation (e.g. greater than the "reaction time" or "time lag" of gravity).
 - The gravitational field observed in subluminal space would appear stationary, even though the mass is moving through superluminal space at v>>c.
 - Ties in with spacetime fluidics, compressibility and viscosity.

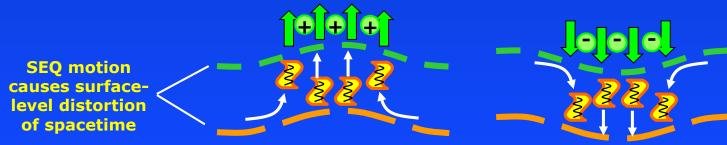


Charge in Tri-Space

- Perceived when the trajectory <u>or</u> orientation of a SEQ has any component <u>PERPENDICULAR</u> to the spacetime surface.
 - Only one "end" of SEQ is visible from either space.

Luminal Plane 90° ESSUPERIum. Space Individual SEOs SEOs in motion

- A highly dense charge field will locally distort the spacetime surface, thus creating charge polarity.
 - Charge dynamics (attraction/repulsion) caused by surface tension effects on the spacetime surface, i.e. "quantum gravity"



Notional "+" and "-" charges

Charge appears to radiate. Charge density drops off over distance due to spacetime viscosity and damping.

Magnetism in Tri-Space

- Perceived when the trajectory <u>or</u> orientation of a SEQ has any component <u>PARALLEL</u> to the spacetime surface.

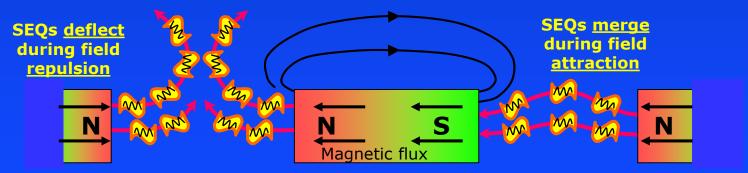
SUBlum. Space



SUPERlum. Space Individual SEQs

SEQs in motion

- These fields do not act on or influence the spacetime surface, but are affected by spacetime fluidics.
 - Fields "flow" similar to eddy currents in fluid dynamics.
- They do not contribute to particle quantum gravity.

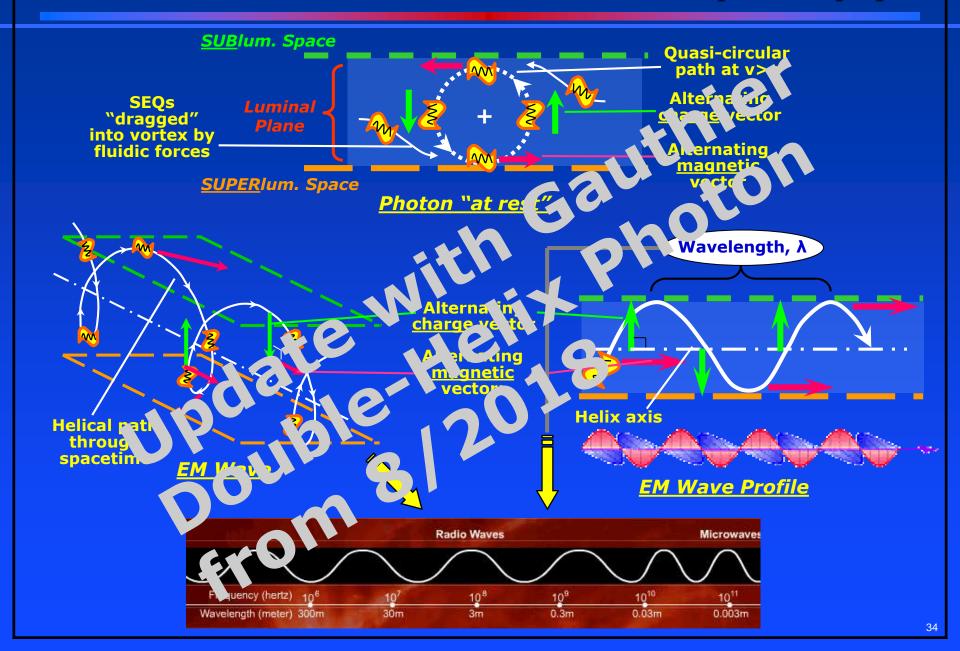


Magnetic fields are dynamic and have more degrees of freedom than charge fields, thus permeating larger regions of space.

Photons and EM Waves in Tri-Space (1)

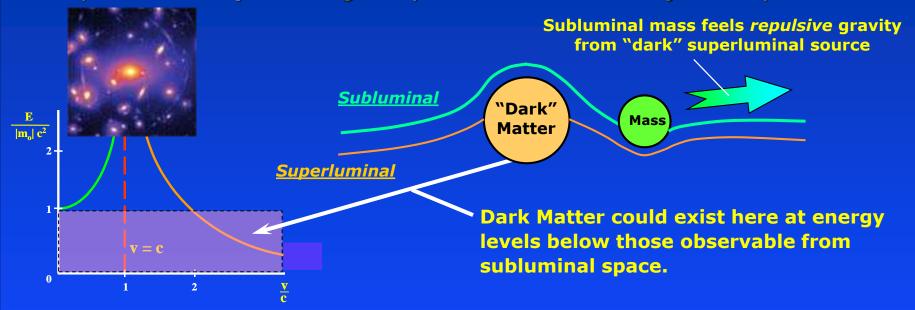
- A <u>photon</u> is perceived when superluminal trajectory of an SEQ produces an eddy-like vortex within the spacetime thickness.
 - Axis of rotation is parallel to the spacetime surface.
 - Photons have both charge and magnetism, but these change polarity so quickly that the photon "appears" to be devoid of all fields.
 - Reversal occurs on the order of Planck time(?).
 - Behaves like a particle.
 - Fundamental building block of heavier particles.
- An <u>EM wave</u> is created when an "at rest" photon gets a directional momentum kick by other SEQs.
 - Axis of rotation is still parallel to the luminal plane, but path becomes helical.
 - Propagation speed depends on spacetime density.
 - Charge and magnetism continue to change polarity, but are now temporally and spatially observed.
 - Wavelength and frequency become measurable.
 - Charge and magnetism are 90° out of phase.
 - Tri-Space suggests the magnetic component of EM waves are always present.

Photons and EM Waves in Tri-Space (2)



Dark Matter and Dark Energy

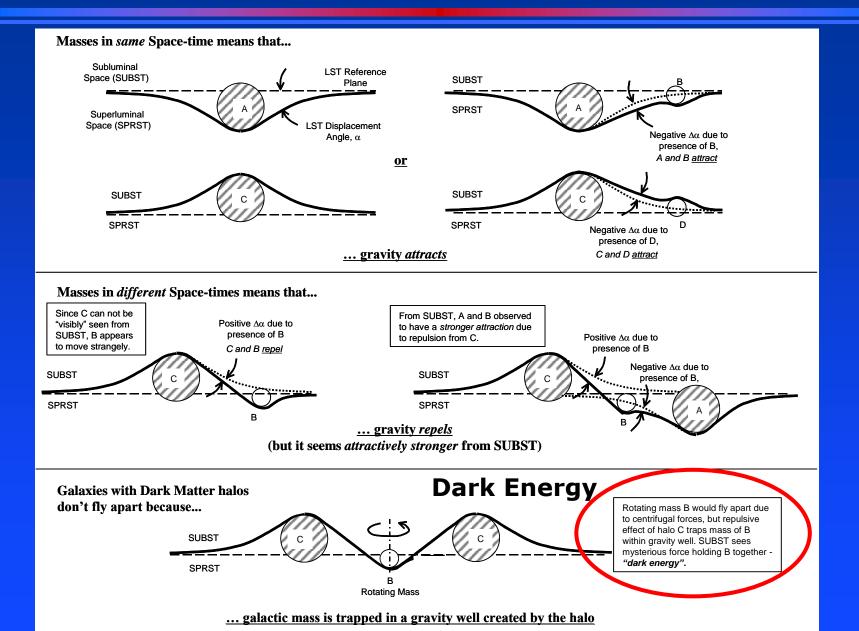
- The Trans-Space Mass-Energy Relation permits real, positive mass to exist in either, but only one space.
- Mass in one space will remain visibly unseen ("dark") and produce a repulsive gravity effect within the adjacent space.



<u>Dark Matter</u> is proposed to be *mass in superluminal* space that can only be "seen" by its repulsive gravitational *energy in subluminal space*.

<u>Dark Energy</u> is subluminal mass being repelled by superluminal mass.

Tri-Space Mass and Dark Matter/Energy Dynamics



Black Holes in Tri-Space

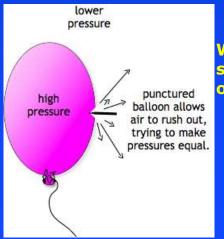
- A black hole can be modeled in Tri-Space as a choked flow opening between sub- and superluminal spaces.
 - **It really is a hole in spacetime.
 - The difference in pressure between high-pressure subluminal space and lower-pressure superluminal space cause the hole to be choked.
 - ✓ The hole's physical size will determine how much 'stuff' it can swallow.
- Mass that has been gravitationally pulled into the hole which can't get through gets sent back into subluminal space along the hole's axis.
 - Jets of matter have been observed exiting from black holes at relativistic velocities from both ends of the event horizon.
- Mass SEQs that make it through convert to superluminal mass

Can feedback into dark matter halos

Collapsing star causes...



Which kind of leads to...



Which sort of...





Possible Experiments to Test Tri-Space

- Characterizing the timelag of spacetime:
 - Will answer if spacetime has a viscosity and a resistance to motion for an accelerating mass
 - Would support fluidic spacetime model
 - Should be testable in a laboratory
- Testing Kaluza theory for existence of 5th dimension (superluminal space):
 - Proposed by Dr. Lance Williams in 2016
 - Theory explores unifying General Relativity and Electromagnetics
 - Comparing the time dilation effects of charged clocks
- Examination of Gauthier's models of the electron and photon for testable valdiations:
 - Would show if the SEQ models could be used to accurately characterize heavier or more complex particles
 - If so, this would directly support that the SEQ could be the fundamental constituent of spacetime
- The work showcased at this event:
 - All of the work presented here can be modeled using the tools of Tri-Space

Comments Based on Tri-Space

- A common set of physical laws extends to ALL scales of existence in the universe. They are very fluid-like.
- Gravity and inertia are resultant effects of how spacetime reacts to from the presence of mass energy. They are <u>not</u> caused by spacetime (non-Maxwellian).
- Gravity and inertia cannot be manipulated or controlled by EM forces. They are separate manifestations that exist within spacetime itself. Gravity-like phenomena, however can be manifest and be represented (charge attraction, magnetism) in Tri-Space.
- Inertia cannot be "felt" without the presence of gravity, but gravity can exist without inertia.

Predictions Based on Tri-Space

- Dark Matter will be found to be gravitationally repulsive to normal matter.
- Dark Matter will be found to have both rotation and linear motion within space.
- Dark Matter will be found to be very large (expansive).
- Dark Matter will be found as the cause of Dark Energy.
- Quantum mechanics will be found to not be 'instantaneous', but will in fact be highly superluminal.
 - Entanglement, tunneling
- Some constants, such as G, c, ϵ_0 , μ_0 , will be found to have changed since the early universe.
 - Perhaps others as well
- The SEQ will be able to describe the exact characteristics of other particles as it does for the electron and photon.
 - Protons, neutrons, quarks, etc.
- Superluminal space will be found to actually exist.
 - *∡* 5th dimension, hyperspace, etc.
 - Possibly from Kaluza theory (Williams, 2016)



Summary (1)

- Tri-Space is a <u>conceptual, graphical, topological model</u> of the universe that consists of two co-existing spaces (sub- and superluminal) separated by one luminal boundary.
 - Gravity acts only in the luminal plane and is currently the only common phenomenon observable from both spaces
- The SEQ is the fundamental constituent of spacetime. It makes up everything.
- Mass and energy could be interchangeable between spaces at the subatomic (quark) level, and possibly beyond.
- Spacetime seems to obey laws similar to fluid dynamics, regardless of scale.
 - Mature seem to prefer simplicity and commonality
- Spacetime may exist in different phases determined by ???? which determines the preferred space of existence for a mass energy.
- More detail needs to be added to the characteristics of Superluminal Space.
 - Z Completely hypothetical, but logically-inferred
- The Trans-Space FTL concept proposes that a mass can <u>traverse</u> sublight space by <u>moving through</u> superlight space.
- Gravity is created by both a <u>distortion and displacement</u> of spacetime. Inertia is analogous to the <u>local</u>, fluidic displacement and delayed reaction of spacetime from a moving mass (viscosity).

Summary (2)

- Charge and magnetism are observed perceptions of how SEQs are oriented with respect to the luminal surface. Photons and EM are extensions of these.
- Dark matter is superluminal mass that manifests itself as repulsive, but seemingly attractive gravitational energy in our space. Dark energy is simply the repulsive effect of subluminal matter from superluminal matter.
- Black holes are holes in spacetime that behave like choked flow between spaces.
- Validation experiments have been proposed to test aspects of Tri-Space.
- Science desperately needs new approaches to explain recent discoveries in quantum physics and cosmology. Tri-Space may be one possible avenue to explore.
 - Cosmology and quantum mechanics are intimately related through a common set of laws, mostly based on the characteristics of fluidic space.
- From a propulsion perspective, an "alternate space", like superluminal space, is necessary for FTL travel to be possible.
 - Other concepts have to deal with relativity issues or exotic mass/energies.
 And finally...

Open minds and the defiance of convention are essential for the advancement of technology.

There Will ALWAYS be Skeptics

From the October 9th, 1903 edition of the The New York Times

"[A] flying machine which will really fly might be evolved by the combined and continuous efforts of mathematicians and mechanicians in from <u>one million to ten million years</u>."

From the October 9th, 1903 entry in Orville Wright's diary:



"We started assembly today."

Inspriational Quotes

"So many of our dreams at first seem impossible, then they seem improbable, and then when we summon the will, they soon become inevitable."

- Christopher Reeve, Actor

"You have kindled a fire, and we shall not let it die out, but will bend every effort to make the greatest dream of mankind come true."

- Prof. Hermann Oberth to Tsiolkovskii, 1929

Thank You for Your Attention!



Photo Credits

TITLE PAGE: (Galactic supercluster) http://www.nist.gov/public_affairs/colloquia/cosmic_gc3_new.gif

(Intertwined galaxies) http://www.spaceflightnow.com, "Galaxies don mask of stars in new

Spitzer image, "NASA/JPL NEWS RELEASE, Posted: April 26, 2006.

SLIDE 4: (Galactic cluster b&w) http://nssdc.gsfc.nasa.gov/photo_gallery/photogallery-astro-

galaxy.html

SLIDE 7: (Sky survey) http://www.abc.net.au/science/slab/sim/cmb.htm

(Water droplets) http://www.adam-hart-davis.pwp.blueyonder.co.uk/photos.htm

SLIDE 11: (Interference and diffraction) http://hyperphysics.phy-astr.gsu.edu

(Cesium ions on copper)

http://nobelprize.org/educational_games/physics/microscopes/scanning/gallery/7.html

SLIDE 12: (Wave refraction) http://www.ifh.ee.ethz.ch/~fvtd/fvtd_edu.html

(Expansion energy) Drawn by Peter A. Garretson, January 20, 2005.

(Particle traces) http://en.wikipedia.org/wiki/Image:Vortex.jpg

(Black hole) http://www.spaceflightnow.com, "Closest-spaced giant black hole pair found, "

NATIONAL RADIO ASTRONOMY OBSERVATORY NEWS RELEASE, Posted: May 1, 2006.

SLIDE 13: (Galactic cluster color) http://www.spaceflightnow.com, "Galaxies are born inside dark matter

clumps, Spitzer shows, "CORNELL UNIVERSITY NEWS RELEASE, Posted: April 22, 2006.

SLIDE 14: (Memory foam mattress) http://www.therionresearch.com/s1/contour-foam-pillows.html

https://thumbs.dreamstime.com/z/half-glass-beer-25137517.jpg, Sept. 20, 2016.

http://wolgemuthe.psd401.net/chemistry/09%20-%20pvt/images/helium%20balloon.jpg, Sept. 21, 2016.

Boundary layer (Upr left) Munson et al., Fundamentals of Fluid Mechanics, Wiley, 1990.

chart with arrows: http://i.stack.imgur.com/C3UNP.png, Sept. 21, 2016.

https://upload.wikimedia.org/wikipedia/commons/thumb/1/13/Carbon_dioxide_pressure-

temperature phase diagram.svg/2000px-Carbon dioxide pressure-

temperature phase diagram.svg.png, Sept. 21, 2016.

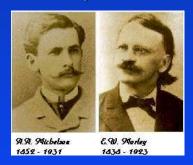
http://s.ngm.com/2014/03/black-holes/img/black-holes-opener-615.jpg, Sept. 21, 2016.

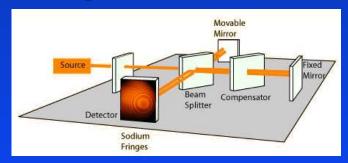
http://www.cmmap.org/images/learn/clouds/balloon.jpg, Sept. 21, 2016



Brief History of Fluidic Spacetime

- Pre-modern studies explored the concept of a transmission medium for electromagnetism (EM) and light.
 - Medium was named the "Aether", "Luminferous Aether", and was proposed to have fluid-like properties.
- Numerous individuals unsuccessfully attempted to quantify properties of the Aether.
 - Michelson-Morley Experiment (1887): Orbit of earth through Aether would unidirectionally affect the speed of light. Yielded a null result.





- By the early 20th century, new theories like relativity (SR + GR) and quantum mechanics (QM) had evolved to describe EM and light without the need for Aether.
 - These concepts quickly became widely accepted in favor of the Aether.
 - Phenomena still exist, however, that QM cannot model or explain.
- Today, though, the possibility exists that spacetime may exhibit fluidic properties as once believed based on re-examination of conventions of accepted theory

Modern Theories and Fluidic Spacetime

- The treatment of spacetime as a fluid in order to model natural processes is returning to modern thinking:
 - "Fluid Dynamic Simulations of Warp Drive Flight Through Negative Pressure Zero-Point Vacuum"

Froning, H. D., and Roach, R. L., STAIF-07, AIP Conf. Proceedings 880, 2007.

"Inertia, Electromagnetism and Fluid Dynamics"

Martins, A. A. and Pinheiro, M. J., STAIF-08, AIP Conf. Proceedings 969, 2008.

- "Beyond the Light Barrier: A Concept for Superluminal Travel"

 Meholic, G. V., 34th AIAA/ASME/SAE/ASEE JPC, AIAA 98-3410, 1998.
- "Another Approach to the Cause of Inertia"
 Meholic, G. V., 38th AIAA/ASME/SAE/ASEE JPC, AIAA 2002-4096, 2002.
- "A Novel View of Spacetime Permitting Faster-Than-Light Travel" Meholic, G. V., STAIF-04, AIP Conf. Proceedings 669, 2004.
- "Linearized Turbulent Fluid Flow as an Analog Model for Linearized General Relativity (Gravitoelectromagnetism)"

Puthoff, H. E., arXiv Paper 0808.3404.pdf, 2008.

To name a few...

The Dynamics of Dark Energy

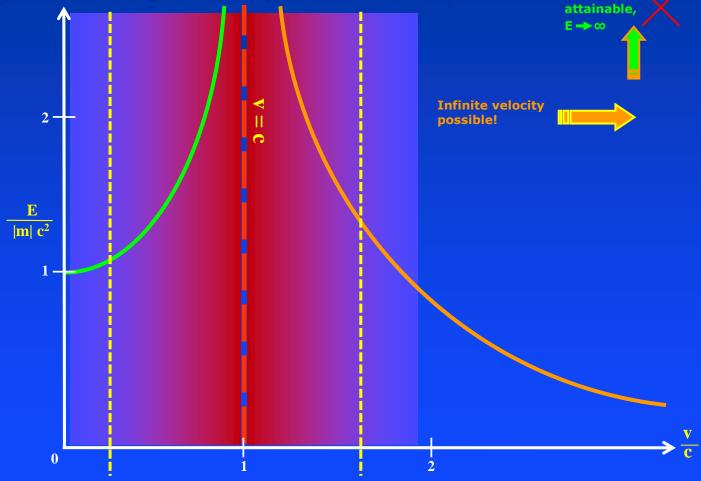
Copeland, et. al, International Journal of Modern Physics D, Vol. 15, No. 11, 2006.

- Many theories (ZPF, string, D-Brane, etc.) have accurate, mathematical representations for charge, magnetic fields and gravity, but none have a physical analog by which to truly define these manifestations in nature.
- The <u>Tri-Space Model of the Universe</u> proposes a <u>topology-based</u>, <u>graphical</u> approach to describe these fundamental phenomena under the inference that <u>spacetime is a quasi-fluid medium</u>.

Mass, Time, and Tri-Spaces

In reality, <u>ALL masses</u> and fields exist <u>on the surface of</u> or <u>within</u> the Luminal Plane.

Mass affects space through time (and vice versa)



v=c never

"Quantum" Gravity



https://someinterestingfacts.net/facts-water-striders/



https://wordlesstech.com/water-strider-acrobatics/