Gravity and Quantum Theory Unified

Dr. Gary Warren
Chief Research Scientist at a Large Business
Hypervortex.com
March 15, 2016

Dr. Warren has Peer Reviewed Publications addressing
Gravity, Electromagnetics, Particle Physics, Atomic Physics, Superconductivity, and more.

EPR Paradox Motivates the Work

- EPR Paradox shows Relativity and QM are in conflict.
  - Relativity says *c* is a fundamental limit.
  - Quantum Theory says faster than *c* is a must.
- Bulk of evidence supports Quantum Mechanics.
- Ergo, the speed of light is likely not fundamental.
- Ergo:
  - Light is unlikely to be physically tied to anything as fundamental as curvature of space.

Does not invalidate the Principle of Relativity or Einstein's mathematics; the work rather refines the physical underpinnings.

Hyperfluid is the Foundation of the Unification Approach

- *Transport in a medium* is the alternate theory for the propagation of light.
- But Michelson-Morley experiment results:
  - Showed no boundary between particles and any medium,
  - And hence was widely interpreted as meaning no medium.
- Michelson-Morley results also could mean particles are made of the same medium. Ergo
  - ➢ Light is a wave in the medium.
  - ➢ Particles are vortexes in the medium.

This provides physicality to Wave-Particle Duality.

Lagrangian for Hyperfluid

$$L = \int \left(\frac{P_\mu^2}{2M} - \frac{k_V}{2} \left(\frac{\partial P_\mu}{\partial x_\nu} - \frac{\partial P_\nu}{\partial x_\mu} \right)^2 - \frac{k_G}{2M} \left(\frac{\partial M}{\partial x_\mu} \right)^2 + \lambda \left(\frac{\partial M}{\partial t} + \frac{\partial P_\mu}{\partial x_\mu} \right) \right) d^4 x_\mu$$

4D

Kinetic Energy of the Hyperfluid

Potential Energy due to Velocity Gradients

Potential Energy due to Density Gradients

Continuity
Fluid cannot disappear in one place and reappear in another.

- 4 flat spatial dimensions, global time.
- Clock rates vary; being made of hyperfluid they are affected by its local properties.
- Ruler sizes vary for similar reason.
- Our observation of curved space-time is explained by the model's results.

Lagrangian's Equations of Motion Directly Map to the Known Forces

$$2k_V \frac{\partial}{\partial x_v}\left(\frac{\partial P_\mu}{\partial x_v} - \frac{\partial P_v}{\partial x_\mu}\right) = \frac{\partial \lambda}{\partial x_\mu} - \frac{P_\mu}{M}$$

Provides electromagnetic forces in covariant form

$$\frac{k_G}{M}\frac{\partial^2 M}{\partial x_\mu^2} - \frac{k_G}{M^2}\left(\frac{\partial M}{\partial x_\mu}\right)^2 = \frac{\partial \lambda}{\partial t} + \frac{P_\mu^2}{2M^2}$$

An Equation for Gravity

1. Equations approximately separable in free space.
2. Solve together to compute:
   particle properties, strong and weak forces.

Electromagnetics in the Hyperfluid

$$2k_V \frac{\partial}{\partial x_v}\left(\frac{\partial P_\mu}{\partial x_v} - \frac{\partial P_v}{\partial x_\mu}\right) = \frac{\partial \lambda}{\partial x_\mu} - \frac{P_\mu}{M}$$

Relates Maxwell's Equations vector potential to hyperfluid momentum

Defines charge in terms hyperfluid properties.

- Hyperfluid motion creates the observed relation: *w=ct.*

Gravity in Hyperfluid

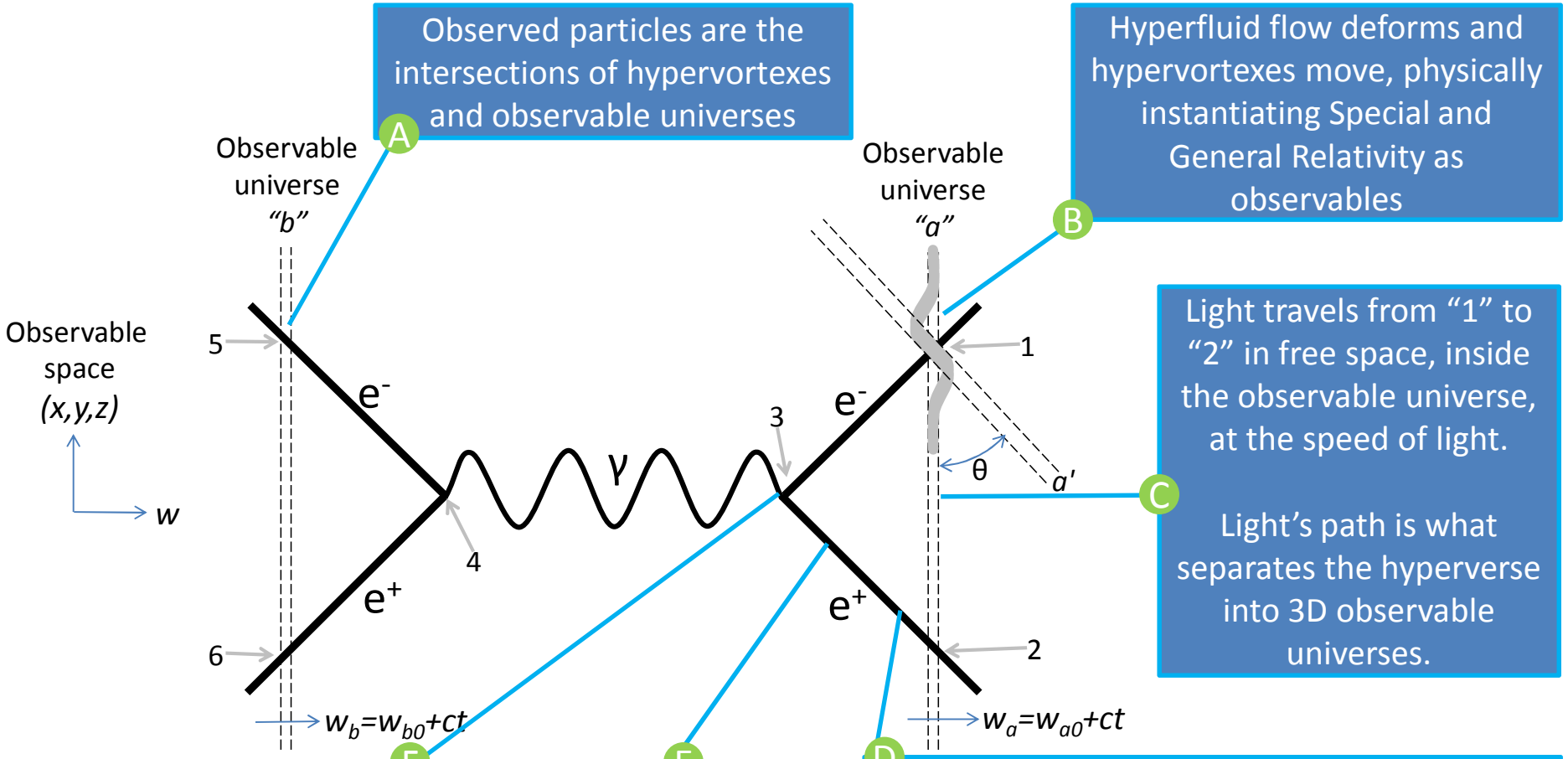
- Gravity equation has exact homogeneous solution:

$$M(r) = M_\infty \prod_{i=1}^{n} exp\left(-\frac{\alpha_i}{|r - r_i|}\right)$$

Exact solution for *n* particles

- $r^2 \equiv x^2 + y^2 + z^2$, independent of w (ergo Hypervortexes)
- Fluid density drops to zero at particle center.
- The solution enables deriving many things that General Relativity cannot:
  - $1/r^2$ gravitational force at $r \gg \alpha$. (i.e. in far field)
  - No singularity at $r = 0$ (i.e. relativity is satisfied everywhere)
  - Gravity additive for multiple masses for $r \gg \alpha_i$ for all i .
  - Inertial mass and gravitational mass are the same.

EPR Resolved in Hyperfluid; Shown with Modified Feynman Diagram



Dark Forces Explained in Hyperfluid

- Dark Matter
  - Dark matter was introduced to explain how galaxies hold together despite mass deficit.
  - In hyperfluid, galaxies are our observation of very large hypervortexes.
- Dark Energy
  - In hyperfluid, an accelerating expansion simply means that our observable universe is traveling into a region of lower hyperfluid density.

To Do

1. Measure speed of longitudinal waves along hypervortexes.
2. Explore possible additional terms for the Lagrangian that are significant where $M<<M_{\infty}$
3. Finish deriving the relation between the mathematics of General Relativity and the Hyperfluid Lagrangian.
4. Solve full coupled equations for hypervortex details, i.e. particles, strong forces, and weak forces.
5. …

Summary

- Gravity and Quantum Theory enable computing different observables without direct reference to a 4^{th} spatial dimension.
- A 4^{th} spatial dimension filled with hyperfluid provides:
  - Unification
  - Physical understanding
  - A Lagrangian for computing specifics.
- Visit hypervortex.com for more details and topics for further investigation.