ENTANGLEMENT EXISTS

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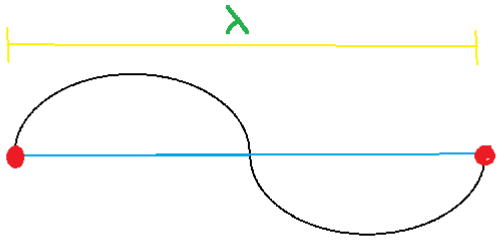
ABSTRACT

Many brilliant mathematicians and scientists, including Galileo Galilei, Johannes Kepler, Nicolaus Copernicus, Gottfried von Leibniz, and Stephen Hawking, have contributed enormously to humankind's knowledge of this incredible universe. In 1687, Sir Isaac Newton published his Philosophiae Naturalis Principia Mathematica to start what is now called classical mechanics in a three-dimensional universe. His mathematical approach was dominant for physicists until, in 1905, Albert Einstein published a paper that included Special Relativity. Suddenly, physicists were using a four-dimensional geometry instead of a three-dimensional geometry. For more than one hundred years, Albert Einstein's mathematical approach has been dominant for physicists. Einstein's corrections to Newton's geometrical mathematics enabled much better analysis for high-velocity situations. Generations after generations of brilliant, hardworking mathematicians and scientists have given us much more knowledge to be used for human advancement. Following my intellectual predecessors, I have attempted to refine very difficult concepts and equations. I propose that particular adjustments to specific assumptions, concerning light speed as a constant, and concerning reversibility of time, might lead to improvement of our functional, physical geometry to a new "peculiar" geometry. Further, these particular adjustments to specific assumptions might provide new formulation of Maxwell's and Einstein's equations. Alternative formulations are discussed and considered. Topics of vital interest will be addressed and reformulated, including a new derivation for the Navier-Stokes equation and implications for Fluid Dynamics. Please enjoy this introduction to the IRREVERSIBLE and REVERSIBLE theoretic constructs, and the new general "universal conservation" equation from which Navier-Stokes equation may be derived. This paper has major ramifications for Black Hole physics and new mathematics of volume. Most important is the introduction of Entanglement to surprisingly solve the problem associated with different mathematics for macroscopic and microscopic situations.

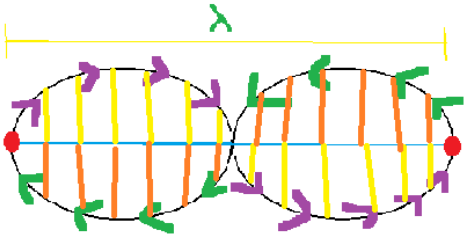
ENTANGLEMENT DIAGRAMS

A few days ago, I sketched the following diagrams as I attempted to understand what Entanglement is. Those diagrams flashed into my mind as I was attempting to solve an extremely difficult problem to combine macroscopic and microscopic equations. These diagrams will be very relevant later in this paper.



We grew up with the belief that a mass has a single, specific position at any time. But duality of nature, as mass and as wave, has been theorised for such small entities as photons. A wave occurs between two points that are a wave-length apart. I propose that such small entities as photons actually have duality of position.

The two positions of a photon can be far more than ten kilometres apart, but often they are still close. The two-positional photon is an entirety that follows mathematical laws of physics. The human body consists of small entities that often exist in the body and elsewhere for Entanglement. ..... Peter Donald Rodgers, 7/11/2014



The wave goes to-and-fro between the two points of the entity.

A human consists of end positions of small sub-atomic entities each with duality of position and a wave moving between each pair. The other ends are internal or external to the human's body.

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SPECIAL RELATIVITY

Albert Einstein revolutionised theoretical physics. For about two hundred years, Sir Isaac Newton's physics theory was very popular as it predicted many events. In 1905, after Newtonian physics failures, Albert Einstein proposed revolutionary Special Relativity theory that has been popular for a hundred years. Physics enthusiasts need to compare assumptions and properties of Newton's theory with those of Einstein's SR theory.

NEWTON'S ASSUMPTIONS AND PROPERTIES IN NEWTONIAN PHYSICS:

An infinite number of inertial frames exist. Each inertial frame extends across the universe. Relative uniform motion between two inertial frames always happens. (The assumption of absolute space is unnecessary as revealed by relativistic aspects of mechanics.) All possibilities of inertial frames' relative uniform motions occur. Time is universally the same so that there is absolute time. A Galilean transformation relates any two inertial frames. Newtonian laws, including those for gravity, apply in all inertial frames.

EINSTEIN'S ASSUMPTIONS AND PROPERTIES IN SR PHYSICS:

All observers experience light's velocity in a vacuum as the same constant c that is independent of any light source's motion. The speed of light is the upper limit to the relative velocity between two inertial frames. Each inertial frame has its specific time. Time is not universally the same. A Lorentz transformation relates any two inertial frames. Invariant physics laws apply in all inertial frames. ISOTROPY OF SPACE: An isotropic, electromagnetic medium has permittivity, ε, and permeability, μ, both uniform in all directions of the medium, and most simply in free space. HOMOGENEITY OF SPACE: A homogeneous space has consistent properties at every point, and has no irregularities. INDEPENDENT RODS AND CLOCKS: The measurements of rods and clocks are independent of past measurements. In 1632, Galileo Galilei postulated that no absolute and well-defined state of rest exists. In SR, Einstein applied Galileo's principle of relativity to only inertial reference frames. SPECIAL PRINCIPLE OF RELATIVITY: Any physical laws that apply to a co-ordinate system K also apply to any other co-ordinate system K' moving in uniform translation to K. CONCEPT OF SIMPLICITY: "If you can't explain it to a six year old, you don't understand it yourself." … Einstein.

Special Relativity (SR or STR) is a popular physics theory involving space and time dimensions. SR especially predicts what happens in very-high-velocity situations. Experimental evidence has verified many consequences due to SR: contraction of length, dilation of time, equivalence of mass and energy, relativistic mass, relativity of simultaneity, and an upper limit of universal velocity.

Experimental results from before SR provided evidence for the validity of SR. In 1851, Hippolyte Fizeau had investigated relative speeds of light in moving water. Fizeau discovered the unexpected result that measured light's speed is not a simple addition of light's speed

through the medium and the medium's speed. 54 years later, Einstein's SR theory enabled Fizeau's results to be understood.

The Michelson-Morley experiment's results also intrigued Einstein. In 1887, detection of relative motion of matter through a stationary luminiferous aether did not happen for Albert Michelson and Edward Morley. That inability to detect such relative motion implied that the aether theory was unacceptable, and helped lead to SR. The Michelson-Morley experiment is very significant for acceptance of SR theory.

These experiments led to insights that significantly inspired Einstein during his development of SR theory in its Minkowski space-time. Hermann Minkowski developed the Minkowski diagram that illustrates the properties of space and time in SR. Minkowski space is considered to be a homogeneous space of the Poincaré group. In Newtonian mechanics, physicists use 3d vectors in Euclidean space, with absolute time. In SR, physicists use 4d vectors in Minkowski space-time.

This mathematical construction of dimensions enabled Einstein's SR theory to be formulated. The three dimensions of space from Euclidean space and the 4th dimension, of time by speed of light, are combined in a four-dimensional Minkowski manifold. For simplicity's sake, because the speed of light is a constant in SR, the dimension of time by speed of light is considered the dimension of time.

Einstein discovered that four-dimensional real vector space of Minkowski was very convenient for expressing his concepts. Events or four-vectors are the basic constituents of Minkowski space. A pseudo-Riemannian manifold is the complicated form of a Minkowski space. Minkowski space consists of four mutually orthogonal vectors $\{e_0,e_1,e_2,e_3\}$.

For Euclidean space, $(e_1)^2 = (e_2)^2 = (e_3)^2 = 1$.

For Minkowski space, $-(e_0)^2 = (e_1)^2 = (e_2)^2 = (e_3)^2 = 1$.

(Note that $(e_0)^2 = -1$.)

In SR, relativists manipulate the following matrix: $$\eta = \begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}.$$

Gravitational potential must be much less than c^2 for the Minkowski space-time mathematics to be appropriate.

Knowing Newtonian physics predicted incorrectly for extreme conditions, Albert Einstein strived to discover new physics laws. In 2014, mechanics includes the two most significant pursuits of classical mechanics and quantum mechanics (QM).

Classical mechanics, called Newtonian mechanics, consists of physical laws describing the motion of bodies acted upon by a system of forces. Classical mechanics is appropriate for large objects at low speeds. Newton was the first to develop an equation connecting force and momentum. Newton's Second Law:

$$\mathbf{F} = \frac{\mathrm{d}\mathbf{p}}{\mathrm{d}t} = \frac{\mathrm{d}(m\mathbf{v})}{\mathrm{d}t}.$$ **(Therefore, F = ma.)**

For a variable force, that is a function of r, acting upon a particle that moves from r_1 to r_2 along a path *C*, the line integral for the work done is:

$$W = \int_C \mathbf{F}(\mathbf{r}) \cdot \mathrm{d}\mathbf{r}\,.$$

A conservative force is a variable force that is a function of r, acting upon a particle that moves from r_1 to r_2 along any path *C*, and having a constant line integral for the work done:

$$W = \int_C \mathbf{F}(\mathbf{r}) \cdot \mathrm{d}\mathbf{r}\,.$$

W = constant ….. (going between r_1 and r_2).

Gravitational and electrostatic forces are conservative forces. Einstein realised that Newtonian equations and Maxwell's electromagnetic equations were incompatible with each other.

If a particle has mass m and is moving at speed v, it has kinetic energy:

$E_\mathrm{k} = \frac{1}{2}mv^2\,.$

For any large multi-particle object, the total kinetic energy equals the summation of the kinetic energies of all particles within the object. According to the work-energy theorem, the total work *W* done on a "constant mass m" particle, from position r_1 to r_2 , is equal to the change of the particle's kinetic energy E_k :

$W = \Delta E_\mathrm{k} = E_{\mathrm{k},2} - E_{\mathrm{k},1} = \frac{1}{2}m\left(v_2^2 - v_1^2\right)\,.$

Conservation of energy **states that, for conservative forces, constancy of total energy,** $\sum E = E_\mathrm{k} + E_\mathrm{p}$ **, in time exists.**

With the Lorentz force law, Maxwell's partial differential equations explain how charges, currents, and the fields themselves create and change electric and magnetic fields. Initial, unrefined examples of Maxwell's equations were published by James Clerk Maxwell in 1861. Physics enthusiasts need to realize that Maxwell's differential equations are not totally accurate, universal laws. Maxwell's equations provide a classical simplification of the less erroneous, more advanced quantum electrodynamics theory.

Maxwell's equations include universal constants: permittivity of free space = ε_0 ; permeability of free space = μ_0 . A vacuum contains no charges and no currents. Therefore, in a vacuum, charge ρ = 0, and current J = 0. In a vacuum, Maxwell's equations simplify to:

$$\nabla \cdot \mathbf{E} = 0 \qquad \nabla \times \mathbf{E} = -\frac{\partial \mathbf{B}}{\partial t},$$

$$\nabla \cdot \mathbf{B} = 0 \qquad \nabla \times \mathbf{B} = \frac{1}{c^2}\frac{\partial \mathbf{E}}{\partial t}.$$

In a vacuum, the wave equations simplify to $\frac{1}{c^2}\frac{\partial^2 \mathbf{E}}{\partial t^2} - \nabla^2 \mathbf{E} = 0\,, \quad \frac{1}{c^2}\frac{\partial^2 \mathbf{B}}{\partial t^2} - \nabla^2 \mathbf{B} = 0\,,$

to reveal that the speed of light in a vacuum is $c = \frac{1}{\sqrt{\mu_0 \varepsilon_0}} = 2.99792458 \times 10^8\,\mathrm{m\ s^{-1}}$ **.**

Maxwell's derived wave equations for a vacuum give a sinusoidal plane wave as one special solution. Maxwell's equations explain the propagation of electromagnetic waves through space.

For extremely strong fields and extremely short distances, Maxwell's equations are inappropriate. Individual photons, non-classical light, and quantum entanglement of electromagnetic fields are predicted to not and never exist by Maxwell's equations, but, hey presto, they do exist. Theoretical physics and reality can be very confusing now in 2014.

More than one hundred years ago, confused by theoretical physics and universal reality, Einstein wrote, "Gradually, I despaired of the possibility of discovering the true laws by means of constructive efforts based on known facts." In 1905, Albert Einstein proposed his special relativity in his paper "On the Electrodynamics of Moving Bodies".

In his physics paper, important for SR, Einstein placed emphasis on explaining what simultaneity and simultaneous events are. If something happens at a specific location at a specific time, two events are simultaneous events: the happening and the time on a clock. This becomes more complicated when the events are occurring at different locations- especially if remote from each other. In SR, light travelling from A to B takes the same amount of time as light travelling from B to A. Light leaves A at time t_{A}**, is reflected at B at time** t_{B}**, and reaches A at time** t'_{A}**.**

Using two synchronized clocks gives that $t_{\mathrm{B}} - t_{\mathrm{A}} = t'_{\mathrm{A}} - t_{\mathrm{B}}.$

Einstein discusses assumptions for synchronism of clocks at any number of different points. If clock A synchronizes with clock B, then the reverse also happens. Further, if clock A synchronizes with clock B and clock C, those two clocks synchronize with clock A, but also synchronize with each other. This can be expanded to an infinite number of clocks. The time of an event is given by a stationary clock at the location of the event and simultaneous with the event.

The universal velocity of light in a vacuum is given by the equation

$\frac{2\mathrm{AB}}{t'_A - t_A} = c,$ **a constant.**

If there is an observer moving at velocity v with the rod moving at velocity v,

$t_{\mathrm{B}} - t_{\mathrm{A}} = \frac{r_{\mathrm{AB}}}{c - v}$ and $t'_{\mathrm{A}} - t_{\mathrm{B}} = \frac{r_{\mathrm{AB}}}{c + v}$

So it is not true that $t_{\mathrm{B}} - t_{\mathrm{A}} = t'_{\mathrm{A}} - t_{\mathrm{B}}.$

That means that, for an observer in the moving system, the two clocks, at A and B ends of the rod, are not synchronous, while, for an observer in the stationary system, the two clocks are synchronous. Simultaneity is not absolute: Two simultaneous events to observers at rest are not simultaneous events to observers in a moving system.

Reading Einstein's paper led to the following comparison:

$x^2+y^2=r^2$ is the equation of a circle. $x^2+y^2+z^2=r^2$ is the equation of a sphere. $x^2+y^2+z^2=c^2t^2$ is the equation of a spherical light-wave.

Therefore, a transformation of a spherical light-wave with constant velocity c gives another spherical light-wave with constant velocity c. Einstein mentioned that electric and magnetic forces are not independent of motion of the system of co-ordinates. A subset of the Poincaré group of symmetry transformations, Lorentz transformations were mathematically appropriate for relativity theory.

LORENTZ TRANSFORMATION: Observer *O* uses co-ordinate system (*t, x, y, z*). Observer *O′* uses co-ordinate system (*t′, x′, y′, z′*). The respective axes of the co-ordinate systems are collinear. A relative velocity between the two observers is *v* along the common *x*-axis; *O* measures *O′* to move at velocity *v* along the coincident *xx′* axes, while *O′* measures *O* to move at velocity −*v* along the coincident *xx′* axes. Also assume that the origins of both co-ordinate systems are the same, that is, coincident times and positions. If all these hold, then the co-ordinate systems are said to be in standard configuration. The inverse of the above Lorentz transformation causes the relationship between the primed and unprimed co-ordinates to be reversed, and causes negation of the uniform relative velocity. This implies that laws of physics do not change under a Lorentz transformation. For inertial reference frames in standard configuration, the Lorentz transformation is:

$$t' = \gamma\left(t - \frac{vx}{c^2}\right)$$

$$x' = \gamma(x - vt)$$

$$y' = y$$

$$z' = z$$

where *v* is relative velocity along the x-axis; *c* is light's speed;

$\gamma = \frac{1}{\sqrt{1-\beta^2}}$ **is the Lorentz factor;** $\beta = \frac{v}{c}$ **is the velocity coefficient along the x-axis. *β* and *γ* often used in relativistic literature. Many physicists use the matrix form of the equations:**

$$\begin{bmatrix} ct' \\ x' \\ y' \\ z' \end{bmatrix} = \begin{bmatrix} \gamma & -\beta\gamma & 0 & 0 \\ -\beta\gamma & \gamma & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} ct \\ x \\ y \\ z \end{bmatrix},$$

The principle of relativity implies that no privileged inertial reference frame exists, so the inverse transformations of frame *F′* to frame *F* must be given by the negative of frame *F* to frame *F′* , so simply negative *v* :

$$t = \gamma \left(t' + \frac{vx'}{c^2} \right)$$
$$x = \gamma \left(x' + vt' \right)$$
$$y = y'$$
$$z = z',$$ **where the value of γ remains unchanged.**

If one ignores the effects of gravity, then there are TEN BASIC WAYS OF DOING SHIFTS of space-time: translation through time, translation through any of the three dimensions of space, rotation around any of the three spatial axes, or a boost in any of the three spatial directions.

SR supplies the rules for transforming an electromagnetic field in one inertial frame into another inertial frame. The principle of relativity was redefined by Einstein to produce the constant speed of light in a vacuum, "c". This universal constant c is exactly 299,792,458 meters per second, because the length of the meter is defined from this constant and the international standard for time.

According to SR, *c* is the maximum speed at which all energy, matter, and information in the universe can move. c is the speed of electromagnetic radiation and gravitational waves.

"Constant light-speed c" was inspired by Maxwell's electromagnetic theory and the experimental non-existence of the luminiferous ether as the Michelson-Morley result. Einstein decided that both ether and an absolute state of rest do not exist.

Absolute universal time is used in classical mechanics, but SR time depends on inertial reference frame and spatial position. Classical mechanics involves an invariant time interval, but SR involves a variant time interval and an invariant space-time interval. Time and space are inseparable as the SR space-time continuum. Events occur at different times for different observers.

An "observer" is a specific inertial reference frame from where objects or events are measured. In SR, an observer is not an idiosyncratic, sentient human experiencing objects and events, but an observer is a specific mathematical context for evaluating objects and events.

An SR, locally Lorentz invariant frame can be defined in curved space-time. A "reference frame" is a non-accelerating, observational perspective in space-time, from which a position can be measured along 3 spatial axes and 1 temporal axis.

An "event" is a 4-co-ordinate reference point in space-time.

Although perspective changes, reality is what reality is. The time lapse depends on the relative velocities of the observers' reference frames.

The twin paradox, a thought experiment about a high-velocity spaceship twin and a stationary stay-on-Earth twin, predicts that the spaceship twin will come back to Earth and discover that the stationary twin has aged much more. Many twin paradox explanations have been offered. What is important is that the twin paradox has been verified by experiments using atomic clocks. Similar time dilation occurs for muons falling through Earth's atmosphere as their decay rate reveals. In SR, time dilation is:

$$\Delta t' = \gamma\,\Delta t = \frac{\Delta t}{\sqrt{1 - \frac{v^2}{c^2}}}$$

Note: Δ*t* is the proper time interval between two events at the same place for an observer A in some inertial frame. Δ*t*′ is the time interval between those same events, as measured by observer B, moving at relative velocity *v* with respect to observer A. Lorentz factor is:

$$\gamma = \frac{1}{\sqrt{1 - \frac{v^2}{c^2}}}\,.$$

Schwarzschild improved upon SR equations of time dilation by adding gravitational components. In the Schwarzschild metric, the interval dt_E is given by

$$dt_{\mathrm{E}}^2 = \left(1 - \frac{2GM_{\mathrm{i}}}{r_{\mathrm{i}}c^2}\right) dt_{\mathrm{c}}^2 - \left(1 - \frac{2GM_{\mathrm{i}}}{r_{\mathrm{i}}c^2}\right)^{-1} \frac{dx^2 + dy^2 + dz^2}{c^2}$$

where: t_E is proper time; t_c is co-ordinate time. The co-ordinate velocity of the clock is given by

$$v^2 = \frac{dx^2 + dy^2 + dz^2}{dt_{\mathrm{c}}^2}.$$

Particle accelerators, especially at CERN, for the last 60 years, have tested SR's time dilation.

In Euclidean space, we define the Euclidean norm on R^n as the "length" of a vector x through square root:

$$\|\mathbf{x}\| = \sqrt{\mathbf{x} \cdot \mathbf{x}} = \sqrt{\sum_{i=1}^{n} (x_i)^2}.$$

Further, we define the Euclidean metric on R^n as:

$$d(\mathbf{x}, \mathbf{y}) = \|\mathbf{x} - \mathbf{y}\| = \sqrt{\sum_{i=1}^{n} (x_i - y_i)^2}.$$

SR is a rotational symmetry of our space-time. SR can be stated as the invariance of any 4D space-time interval between two events when viewed from any inertial reference frame. A very useful four-vector is the position of an event in space-time, s = (x, y, z, ict).

Physics laws and the two SR postulates unite to predict the mass-energy equivalence. In developing SR, Einstein derived the moving particle's kinetic energy to be:

$$E_k = m_0(\gamma - 1)c^2 = \frac{m_0 c^2}{\sqrt{1 - \frac{v^2}{c^2}}} - m_0 c^2,$$

(with velocity v, rest mass m_0, and Lorentz factor γ). Further, Einstein derived the moving particle's momentum to be:

$$P = \frac{m_0 v}{\sqrt{1 - \frac{v^2}{c^2}}}.$$

Momentum is conserved when a collision occurs.

The relativistic ENERGY-MOMENTUM equation for a particle or a photon is:

$$E^2 - (pc)^2 = (mc^2)^2$$

where the *m* is the rest mass.
$E = mc^2$ is the mass-energy equivalence equation.
In physics, classical mechanics' Galilean transformations are replaced by SR's Lorentz transformations. According to Einstein, the principle of relativity applies for all physics laws. SR relative velocity is mathematically more complicated than classical relative velocity. To an observer, as a particle's velocity approaches light's velocity, its relativistic mass increases more and more rapidly to impede acceleration.
Both matter and radiation have energy and momentum. The SR two postulates are about space-time, not about matter or radiation.
In his 1905 paper, Einstein stated that both energy and momentum conservation laws apply in SR. Einstein believed that an isolated system's total energy, neither created nor destroyed, but modified in form, remains constant as time progresses.
REST MASS and RELATIVISTIC MASS are the two types of mass defined in SR. Rest mass is invariable for all observers in all reference frames. Relativistic mass is variable with relative velocity of the observer.
An overall stationary, multi-particled, confined volume does not have mass that is the sum of its particles' rest masses, but has mass that is progressively more as its particles move faster.
Massless, a photon and a theoretical graviton move at light's speed in every reference frame.
Conservation of energy implies conservation of relativistic mass for any observer and any inertial frame.
For a totally isolated system, SR uses conservation of energy, conservation of momentum, and conservation of relativistic mass for any observer in any specific inertial frame. Energy, momentum and relativistic mass will vary for different observers in different inertial frames. The invariant rest mass will remain the same for all observers.
In 1915, ten years after his SR, Albert Einstein published his GR theory that is more generalised with gravitational effects.
GR and quantum theory are the two major theories of modern physics. How these two theories can be combined is the most significant question for theoretical physicists. Attempts to answer this question have led to failures so far at very high velocities.
GR, incorporating non-Euclidean geometry that becomes Euclidean as gravity lessens to zero, then becomes SR.
SR with QM gives relativistic QM. GR with quantum theory gives quantum gravity that suffers problems. The Theory of Everything, that is an attempt to derive all of physics from the one theory, has not been a success.
The two most successful theories, GR and QM, are incompatible with each other.
In 1913, Niels Bohr introduced the Bohr model of the atom held together by electromagnetic forces. To create the mathematics, Bohr added a quantum rule. The hydrogen atom emitted photons with energy:

$$E = E_i - E_f = R_{\mathrm{E}} \left(\frac{1}{n_f^2} - \frac{1}{n_i^2} \right)$$

(*n_f* = final energy level; *n_i* = initial energy level).

With a photon's energy as $E = \frac{hc}{\lambda}$, **the photon's wavelength is from the Rydberg formula:** $\frac{1}{\lambda} = R \left(\frac{1}{n_f^2} - \frac{1}{n_i^2} \right)$.

In 1928, Paul Dirac created an important relativistic wave equation called the Dirac equation. Relativistic wave equations predict the behavior of high-velocity particles. The Dirac equation explains all spin-½ particles, including electrons and quarks, and agrees with principles of QM and SR. The Dirac equation explained the hydrogen spectrum very well, and predicted that anti-matter exists before anti-matter was experimentally discovered.

QM needed SR before it could explain spin. The fact that anti-particles exist caused theoretical physicists to conclude that relativistic QM needs to be drastically improved to create a better theory of particle interactions.

Mostly, we observe matter much more often than anti-matter. Particle accelerators often produce anti-matter as individual anti-particles. Physicists know that, throughout the universe, high-velocity particle collisions create anti-particles. Anti-matter reacts with matter for annihilation.

The electromagnetic field and the gravitational field are the only two fields with infinite range. Finding the proper axioms for quantum field theory is still an open and difficult problem in mathematics. One of the Millennium Prize Problems—proving the existence of a mass gap in Yang–Mills theory—is linked to this issue.

The Planck length ℓ_{P} **is defined as** $\ell_{\mathrm{P}} = \sqrt{\frac{\hbar G}{c^3}} \approx 1.616\,199(97) \times 10^{-35}\ \mathrm{m}$ **and is extremely small.**

KINETIC MOLECULAR THEORY OF GASES:

I have always been very impressed by The Kinetic Molecular Theory of Gases. Therefore, I will attempt to add these ideas to my unifying field theory of physics equations. The Kinetic Molecular Theory for ideal gases is based on the following assumptions:

1. **The gas consists of very small particles, each of which has a mass.**
2. **The number of molecules is large such that statistical treatment can be applied.**
3. **These molecules are in constant, random motion. The rapidly moving particles constantly collide with each other and with the walls of the container.**
4. **The collisions of gas particles with the walls of the container holding them are perfectly elastic.**
5. **The interactions between molecules are negligible. They exert no forces on one another except during collisions.**

6. **The total volume of the individual gas molecules added up is negligible compared to the volume of the container. This is equivalent to stating that the average distance separating the gas particles is relatively large compared to their size.**
7. **The molecules are perfectly spherical in shape, and elastic in nature.**
8. **The average kinetic energy of the gas particles depends only on the temperature of the system.**
9. **Relativistic effects are negligible.**
10. **Quantum-mechanical effects are negligible. This means that the inter-particle distance is much larger than the thermal de Broglie wavelength and the molecules can be treated as classical objects.**
11. **The time during a collision of a molecule with the container's wall is negligible as comparable to the time between successive collisions.**
12. **The equations of motion of the molecules are time-reversible.**
13. **In addition, if the gas is in a container, the collisions with the walls are assumed to be instantaneous and elastic.**

Cosmological expansion rate indicates that 90% of all matter is dark matter with gravitational effects, but no electromagnetic effects. Evidence for this suggests that our present physics theories are inadequate. SR is a very important part of all modern physics theories including quantum field theory and string theory. String theory requires the existence of extra spatial dimensions for its mathematical consistency. For specified circumstances, GR can be reduced to SR, and, for other specified circumstances, SR can be reduced to Newtonian mechanics. Special relativity has been popular for more than one hundred years.

Einstein's general relativity led to predicted space-time deformation and black holes. Four laws of black hole mechanics, similar to those of thermodynamics, have been created by Stephen Hawking, James Bardeen and Brendan Carter. Hawking's addition of quantum mechanics to the black hole's mathematics, in 1974, inspired a high percentage of humans to believe we know very much about the black hole.

Quantum mechanics and general relativity developed separately because nobody could discover the mathematical connection between them as the problem is extremely difficult to solve. Hawking radiation is a tribute to Stephen Hawking's mathematical ability and creativity, and his realisation certainly improved black hole research by showing that the supposed black hole is much more than a product of Einstein's general relativity.

What happens when things cross the theorised black hole's theorised event horizon is an exciting mind game in which one's spouse might turn into spaghetti or smaller than an electron as anything can happen in the black hole that is seemingly magical. General relativity and quantum mechanics lead to different predictions for what happens in the black hole because theoretical physics is very theoretical and, sometimes, goes far beyond reality to where mathematicians can be very creative and maybe zany.

Worldwide, in January 2014, science journalists delivered surprising articles about Stephen Hawking's announcement that there are no event horizon and no black hole following the theoretical equations, so, obviously, the mathematics is erroneous. Stephen Hawking's statement about the event horizon not existing is major because his confidence in the black hole mathematics has vanished, so the mathematics of theoretical physics must be improved to solve this extremely difficult problem.
Non-existence of the theorised black hole is an extraordinary shock to physicists who know astronomers have taken wonderful pictures of what were believed to be black holes. There really is something in the universe, like a black hole, that follows other mathematical equations.
Another major problem for mathematical physicists has been that they do not have an adequate theoretical generalization from which the current NAVIER-STOKES EQUATION, for fluid dynamics, can be derived.

INTRODUCING REVERSIBLE & IRREVERSIBLE THEORIES

More and more, physicists realize that not all of Einstein's assumptions and properties in SR physics are correct. Because $c^2t^2 = c^2(-t)^2$, it is obvious that Einstein assumed that events are reversible with time as he created Special Relativity. As I write this paper, I use Albert Einstein's reversibility of events with time for my REVERSIBLE THEORY. Also in this paper, I introduce possible irreversibility of events with time in my IRREVERSIBLE THEORY. Decide whether you prefer REVERSIBLE or IRREVERSIBLE.
Not all observers experience light's velocity as the same constant c, because they experience light's velocity to be variable. Rainbows occur because light-rays of different wavelengths travels at different velocities. Whether variable or constant, the speed of light is the upper limit to the relative velocity between two inertial frames. Although, in SR, a Lorentz transformation relates any two inertial frames, the Lorentz transformation needs to be changed for a different number of dimensional co-ordinates.
Einstein's Concept of Simplicity seems to be a joke, and is inappropriate in theoretical physics, because no 6-year-old child can understand difficult mathematical concepts that were espoused by Einstein himself, especially his theory of General Relativity. If anything, the Concept of Simplicity is an invalid justification for the equation of mass-energy equivalence.
In ENTANGLEMENT EXISTS , contraction of length, dilation of time, equivalence of mass and energy, relativistic mass, relativity of simultaneity, and an upper limit of universal velocity can be explained by another theory that develops from the four dimensions of SR.
The Minkowski diagram is appropriate to illustrate the properties of space and time in this new theory of four dimensions. What should be pointed out is that the dimension of (time by speed-of-light) should never have been considered the dimension of (time); this is more

significant when the speed-of-light is a variable. Although SR space is theorized to consist of four mutually orthogonal vectors $\{e_0,e_1,e_2,e_3\}$ so they mathematically follow $-(e_0)^2 = (e_1)^2 = (e_2)^2 = (e_3)^2 = 1$. This mathematical concept is used in ENTANGLEMENT EXISTS .

Relativists use the matrix $\eta = \begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}$ **. In SR, for any large multi-particle object, relativists believe that the total kinetic energy equals the summation of the kinetic energies of all particles within the object, but this belief is not true; kinetic energy is an incorrect concept that seems to apply to some situations.**

It is untrue when the law of *conservation of energy* states that, for conservative forces, constancy of total energy, $\sum E = E_{\mathrm{k}} + E_{\mathrm{p}}$, **in time exists; energy is not the best concept to use, and conservation of energy is incorrect.**

Maxwell's differential equations are not totally accurate, universal laws, so the equations can be improved. When SR is replaced by the more successful Grand Einstein/Rodgers Theory for fast-moving objects or particles, the equations of the more advanced quantum electrodynamics theory can be appropriately replaced or modified.

To find the proposed "constant speed-of-light" for SR, Einstein used Maxwell's equations that include universal constants that are permittivity of free space = ε_0 , and permeability of free space = μ_0 . The truth of reality is that permittivity, permeability, and speed-of-light are all variables. When Einstein wrote, "Gradually, I despaired of the possibility of discovering the true laws by means of constructive efforts based on known facts," he disclosed that some of his assumptions used to create SR are possibly incorrect.

If the universal constant c is exactly 299,792,458 meters per second, because the length of the meter is defined from this constant and the international standard for time, the velocity of light is not definitely constant; this is a fabrication by physicists to make the velocity of light seem constant; in truth, the velocity of light is a variable.

REVERSIBLE THEORY OF PHYSICS

Maxwell's Equations have been extremely important in physics because the four equations are considered to be the basic equations for much of mathematical physics, so undergraduate students learn these equations to pass examinations, although most physicists have not analyzed Maxwell's Equations deeply. I realized that these equations needed to be improved and did not effectively predict some occurrences in physics, like variable velocity of light, and did not unify the fields of physics.

By modifying Maxwell's Equations and adding three equations, I suggested the seven new Equations I→VII for particle 'a' affected by particle 'b', after I struggled with the original equations for a very long time to derive these new equations because the mathematics of the universe is not simple, but is consistently symmetrical. My new Rodgers/Maxwell's equations are initially similar to Maxwell's equations, but relate

particle 'a' to particle 'b' in a multi-massed universe where everything relates to everything else because that is how the universe is.

I did not change Maxwell's I and IV equations very much and merely needed to stress that the equations are about a relationship between two particles, so even time is for each of the specific particles. I changed Maxwell's II and III equations much more because the unification of Coulomb and gravitational fields is very important in these equations and is a major goal in developing a successful UFT, a unifying field of theoretical physics. My equations I and II were developed very meticulously to mathematically explain forces when particles are extremely close because two electrons or two protons attract each other when extremely close and protons and electrons repel each other when extremely close. The permittivity needs to be variable to cause the velocity of light to be variable because the velocity of light definitely is variable after research has shown that light moves at different velocities through different mediums, and that the velocity of light has changed since the Big Bang. Equations V, VI and VII are necessary inclusions that provide elaborate formulations for better comprehension of time and radius.

Lorentz transformations are appropriate for SR, but must be modified for the REVERSIBLE theory for fast-moving objects or particles. In REVERSIBLE, an "event" is a 4-co-ordinate reference point in space like

$\underline{s} = [\, x, y, z, ict]$. Note: $i = (-1)^{1/2}$; and c is a variable or constant.

The twin paradox necessitates a change to the concept of the observer by placing the observer at the centre-of-mass of the entire system because nothing is entirely isolated in this universe where closely and distantly separated particles all always interact.

The SR prediction of mass-energy equivalence, $e = mc^2$, can be further refined.

For REVERSIBLE THEORY, physicists use an equation similar to momentum conservation when a collision occurs. The relativistic energy-momentum equation for a particle or a photon, $E^2 - (pc)^2 = (mc^2)^2$, where *m* is the rest mass, is not always valid in REVERSIBLE THEORY because this revolutionary theory is far less restrictive. Einstein stated that both energy and momentum conservation laws apply in SR, but these laws need to be re-evaluated because energy and momentum are human intellectual constructions that are approximations for certain situations and are incorrect for other situations.

Attempts to combine GR and Quantum Theory have failed because GR may be further refined, because GR is based on SR which may be further refined, mostly because the basic dimensional co-ordinates of SR may be refined (specifically the 4^{th} dimension) and because the belief that speed of light is constant is incorrect.

To improve the Dirac wave equation, physicists need to use the new 4-dimensional geometry of REVERSIBLE THEORY rather than the 4-dimensional geometry of SR. By using this new 4-dimensional geometry instead of SR's old 4-dimensional geometry, physicists can improve what is now relativistic QM to create a better theory of particle interactions; my

REVERSIBLE THEORY is an extremely good analysis of particle interactions in a multi-massed system.
The accepted fact that the electromagnetic field and the gravitational field are the only two fields with infinite range suggests that the two fields result from one field that could be called the gravitational-electromagnetic field that, conceptually, is simplification of physics so a programmed computer could solve very complicated situations rather simply, and more simply than before REVERSIBLE THEORY.
The realization that SR is a very important part of all modern physics theories, including quantum field theory and string theory, reveals that SR is, in many situations, is approximate. The 4-dimensional REVERSIBLE THEORY will substitute for SR.

REVERSIBLE EVENTS WITH TIME

Note that, in this equation, the velocity of light can be a variable, like I have believed for 44 years, or a constant like Albert Einstein believed. This equation implies that events are reversible with time. From a four-dimensional co-ordinate system,

$$\underline{s} = x_1\underline{e}_1 + x_2\underline{e}_2 + x_3\underline{e}_3 + ict\underline{e}_4$$

$$\text{so that } \underline{s}.\underline{s} = (x_1)^2 + (x_2)^2 + (x_3)^2 - (ct)^2$$

This gives the same answer for t as for (-t). That means that events are reversible with time. Similarly for the following equations.

$$\underline{s} = x_1\underline{e}_1 + x_2\underline{e}_2 + x_3\underline{e}_3 + ict\underline{e}_4 + i\lambda\underline{e}_5$$

$$\text{so that } \underline{s}.\underline{s} = (x_1)^2 + (x_2)^2 + (x_3)^2 - (ct)^2 - (\lambda)^2$$

$$\underline{s} = x_1\underline{e}_1 + x_2\underline{e}_2 + x_3\underline{e}_3 + i(ct + \lambda)\underline{e}_4$$

$$\text{so that } \underline{s}.\underline{s} = (x_1)^2 + (x_2)^2 + (x_3)^2 - (ct + \lambda)^2$$

$$= \underline{s}.\underline{s} = (x_1)^2 + (x_2)^2 + (x_3)^2 - (c + h/mx)^2t^2$$

[Note that $\lambda = h/mv = ht/mx$.]

IRREVERSIBLE EVENTS WITH TIME

Einstein's equation implies that events are reversible with time. A major problem is that most people believe that events are irreversible with time. Also believing that events are irreversible with time, I have strived to create an alternative equation.
The most appropriate geometrical equation is the following.

$$\underline{s} = (x_j + i(ct\alpha_a\phi_a\xi_a)/3^{1/2})\underline{e}_1 + (x_j + i(ct\alpha_a\phi_a\xi_a)/3^{1/2})\underline{e}_2 + (x_j + i(c\alpha_a\phi_a\xi_a\, t)/3^{1/2})\underline{e}_3 \ldots \sum_{\text{for } j=1\searrow 3}$$

. Note that c can be variable or constant and there are only three dimensions, but they are peculiar. For these geometries, events are irreversible with time.

$$\underline{s}.\underline{s} = (x_1 + i(ct\alpha_a\phi_a\xi_a)/3^{1/2})^2 + (x_2 + i(ct\alpha_a\phi_a\xi_a)/3^{1/2})^2 + (x_3 + i(ct\alpha_a\phi_a\xi_a)/3^{1/2})^2$$

$= (x_1)^2 + (x_2)^2 + (x_3)^2 + 2(x_1+x_2+x_3)i(ct\alpha_a\phi_a\xi_a)/3^{1/2} - (ct\alpha_a\phi_a\xi_a)^2$.

This gives different answers for t and for (-t). That means that events are irreversible with time. The UNIVERSAL CONSERVATION EQUATION FOR IRREVERSIBLE EVENTS WITH TIME will be different from the previous UNIVERSAL CONSERVATION EQUATION.

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MAXWELL-RODGERS EQUATIONS

Maxwell's Equations are not fully correct for many reasons. Appropriate mathematics would explain why attractive interactions become repulsive, and why repulsive interactions become attractive, at short radii if (δt_a) and (δr_a) are modified. Light-rays are bent by gravity, but light-rays are also bent by a charge. Below, I unify Coulomb and gravitational interactions by introducing variable permittivity ε_{ab}. I improve Schwarzschild's equations for (δt_a) and (δr_a) so they produce reversals in effects of gravity and charge interactions at very short distances.

By modifying Maxwell's Equations and adding four equations, I suggest the eight new MAXWELL-RODGERS Equations I→VIII for particle a.

EQUATION I:

$\int \mathbf{B_a} \cdot \delta \mathbf{A_{ab}} = 0.$

EQUATION II:

$\int \mathbf{E_a} \cdot \delta \mathbf{A_{ab}} = \delta \{Q_aQ_b\varepsilon_{ab}^{-1} - (1/4)\, Q_a^2Q_b^2\varepsilon_{ab}^{-2})\} / \delta Q_b$

$= \delta\{(Q_aQ_b\varepsilon_o^{-1} - 4\pi GM_aM_b) - (1/4)\,(Q_aQ_b\varepsilon_o^{-1} - 4\pi GM_aM_b)^2)\}/\delta Q_b.$

EQUATION III:

$\int \mathbf{B_i} \cdot \delta \mathbf{l_{ij}} = \mu(I_a + \varepsilon\delta\Phi_{Ea}\, \delta t_a^{-1})$

$= \mu(I_a+\{\varepsilon_o^{-1} - 4\pi GM_aM_bQ_a^{-1}Q_b^{-1} - (1/4)Q_aQ_b\varepsilon_o^{-2} + \varepsilon_o^{-1}\pi GM_aM_b - 4\pi^2G^2M_a^2M_b^2Q_a^{-1}Q_b^{-1}\}\, \delta\Phi_{Ea}\delta t_a^{-1}).$

EQUATION IV:

$\int \mathbf{E_a} \cdot \Delta \mathbf{l_{ab}} = -\, \delta\Phi_{Ba}\, (\delta t_b)^{-1}.$

EXTRA EQUATION V:

$(\delta t_a)^2 = (\delta t)^2[1 - Q_aQ_b(4\pi\varepsilon_{ab})^{-1}(M_a)^{-1}r_ar_{ab}^{-2}c_a^{-2}]^{-2} = (\delta t)^2\gamma_a^{-2}.$

EXTRA EQUATION VI:

$(\delta r_a)^2 = (\delta r)^2[1 - Q_aQ_b(4\pi\varepsilon_{ab})^{-1}(M_a)^{-1}r_ar_{ab}^{-2}c_a^{-2}]^2 = (\delta r)^2\gamma_a^2.$

EXTRA EQUATION VII:

$\varepsilon_{ab}^{-1} = (\varepsilon_0^{-1} - 4\pi G\, M_aM_bQ_a^{-1}Q_b^{-1}).$

EXTRA EQUATION VIII:

$M_a = \rho_aV_a \quad \& \quad M_b = \rho_bV_b$

REFINEMENTS TO MAXWELL'S EQUATIONS:

1. **apply to a multi-particled system of charged particles.**
2. **use the centre-of-mass of the entire system as the reference point for distances involved in the equations.**
3. **include variables μ and ε rather than the constants μ_o and ε_o, because it is known that permeability and permittivity are variable.**
4. **predict a variable velocity-of-light that accords with the photon moving at different velocities, and the velocity-of-light changing during history.**
5. **include separate equations for each of particle a& particle b.**
6. **use $(\delta S_{ab})^2 = \delta S_{ab} \cdot \delta S_{ab} = \delta(S_b - S_a).\, \delta(S_b - S_a)$ & $(\delta S_{ba})^2 = \delta S_{ba} \cdot \delta S_{ba} = \delta(S_a - S_b).\, \delta(S_a - S_b)$.**
7. **include the gravitational components as in Schwarzschild's equation to predict gravitational bending of the space-time continuum.**
8. **mathematically explain why particles with similar charges attract each other when at very short distances apart.**
9. **include different times for different charged particles.**
10. **include the fully correct r_{ab} between the particles.**
11. **mathematically explain why mass, like energy, is variable with charge.**

The conservation equations are very significant in physics.

REVERSIBILITY CONSERVATION EQUATION

$$\delta[\sum(M_a\underline{s}_a)] = 0.$$

$$\delta[\sum(\delta(M_a\underline{s}_a)/((1/\delta x_{a1})+ (1/\delta x_{a2})+ (1/\delta x_{a3})+(1/\delta(ic_at_a)))] = 0.$$

$$\delta[\sum(\delta^2(M_a\underline{s}_a)/((1/\delta x_{a1})^2+(1/\delta x_{a2})^2+ (1/\delta x_{a3})^2+ (1/\delta(ic_at_a))^2))] = 0.$$

As I scribbled out my conservation equations, I realised that there is a family of equations with the general equation as below.

$$\delta[(\sum(\delta^z(M_a\underline{s}_a)/((1/\delta x_{a1})^z+(1/\delta x_{a2})^z+ (1/\delta x_{a3})^z+ (1/\delta(ic_at_a))^z))] = 0.$$

[Polar coordinates can be substituted into this equation.]

$\underline{s} = x_1\underline{e}_1 + x_2\underline{e}_2 + x_3\underline{e}_3 + ict\underline{e}_4$ **so that** $\underline{s}.\underline{s} = s^2 = (x_1)^2 + (x_2)^2 + (x_3)^2 - (ct)^2$.

s^2 **gives the same answer for t as for (-t). That means that events are reversible with time.**

IRREVERSIBILITY CONSERVATION EQUATION

$$(M\underline{s}).(M\underline{s}) = M^2[(x_1 + ict/3^{1/2})^2 + (x_2 + ict/3^{1/2})^2 + (x_3 + ict/3^{1/2})^2]$$

$$= M^2[(x_1)^2 + (x_2)^2 + (x_3)^2 + 2(x_1+x_2+x_3)ict/3^{1/2} - c^2t^2]$$

$$= M^2[(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\sin\gamma\sin\eta + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2})^2$$
$$+(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\sin\gamma\cos\eta + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2})^2$$
$$+(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\cos\gamma + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2})^2].$$

$$\delta[(\sum(\delta^z(M_a\underline{s}_a)/((1/\delta x_{a1})^z+(1/\delta x_{a2})^z+ (1/\delta x_{a3})^z$$
$$+ (2(x_1+x_2+x_3)ict/3^{1/2})^{z/2} + (1/\delta(ic_at_a))^z))] = 0.$$

This gives different answers for t and for (-t). That means that events are irreversible with time. The UNIVERSAL CONSERVATION EQUATION FOR IRREVERSIBLE EVENTS WITH TIME will be different from the previous UNIVERSAL CONSERVATION EQUATION.

To simplify the equation further, I re-write it not as mass, but as density by volume. This equation is apt for velocity-of-light that is constant, as Albert Einstein believed, or variable as I believe. Further, this equation is apt whether events are reversible, as Albert Einstein believed, or irreversible, as I believe, with Time.

Note that Z equals any whole number from negative infinity to positive infinity. Density by Volume equals Mass.

Everything existing in this universe, including photons, sub-atomic particles, massive suns, and humans, consists of wave-particles of the same formula, and is a manifestation of

gravitational-electromagnetic waves commonly called light. In theoretical physics, unification of fields has occurred, so this unification is in everything, including humans, as we are part of this psychic universe where all universal particles interact as do the molecules aligning to form a crystal. … Peter Donald Rodgers 2014
Since I first saw the Klein-Gordon Equation, I have been very impressed by it. This equation is a very significant, so I improve the Klein-Gordon Equation in this paper.

ADVANCEMENTS FROM KLEIN-GORDON EQUATION

The Klein-Gordon Equation is

$$[(\sum(\delta^2/\delta x_j^2))-(\delta^2/c^2(\delta t)^2)-M^2c^2h^{-2}]\psi = 0,$$

where $\psi = \sin(x - ct)$.
But, from the Klein-Gordon Equation, I created

$$\psi = \sin(x - ct - \lambda))$$ **where** $\lambda = h/mv$, **and**
my Klein-Gordon-Rodgers-Reversibility Equation

$$[(\sum(\delta^2/\delta x_j^2)) - (\delta^2/c^2(\delta t)^2) - (\delta^2/(\delta\lambda)^2)]\psi = 0.$$

But I propose changes to the Schwarzschild's metric. Firstly, I suggest these are changes to be included.

$$\alpha_a^2 = (1 - (GM_b/r_{ab}) + (Q_aQ_b/4\pi\varepsilon_o M_a r_{ab}))^2;$$

$$\phi_a^2 = (1 - (3P_aV_aM_a^{-1}c_a^{-2}))^2;$$

$$\xi_a^2 = (1 - (\lambda_a/c_at_a))^2 = (1 - (h/(m_av_a\, c_at_a))^2 .$$

Including these, I create the Schwarzschild-Rodgers-Reversibility metric:

$$(\delta(s_a))^2 = -(\delta(c_at_a)\alpha_a\phi_a\xi_a)^2 + (\delta(r_a)\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})^2 + (\delta(\theta_a)r_a)^2.$$

The Schwarzschild-Rodgers Irreversibility metric is more complicated:

$$\begin{aligned}(\delta(s_a))^2 = [\,[\delta\,(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\sin\gamma\sin\eta + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2})\,]^2 \\ + [\delta\,(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\sin\gamma\cos\eta + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2})\,]^2 \\ + [\delta\,(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\cos\gamma + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2})\,]^2\,].\end{aligned}$$

I create my Klein-Gordon-Rodgers-Complex-Reversibility Equation.

$\psi =$ $\sin(-c_at_a\alpha_a\phi_a\xi_a + r_a\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1} + \theta_ar_a)$ **goes into the following.**

$$[-\delta^2/(\delta(c_at_a)\alpha_a\phi_a\xi_a)^2 + \delta^2/(\delta(r_a)\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})^2 + \delta^2/(\delta(\theta_a))^2r_a^2\,]\psi = 0.$$

A major problem is that the equations above, like Albert Einstein's relativity equations, are for situations where REVERSIBILITY of events with time exists. Reversibility never

seems to exist. Like most people, I believe that IRREVERSIBILITY of events with time is what actually exists. Further, the Schwarzschild's metric reveals that polar coordinates are most appropriate to use.

$$\psi = [(\sin(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\sin\gamma\sin\eta + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2}))e_1$$
$$+(\sin(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\sin\gamma\cos\eta + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2}))e_2$$
$$+(\sin(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\cos\gamma + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2}))e_3].$$

But, because it does not contain vectors, I suggest that ψ^2 is easier to use than ψ.

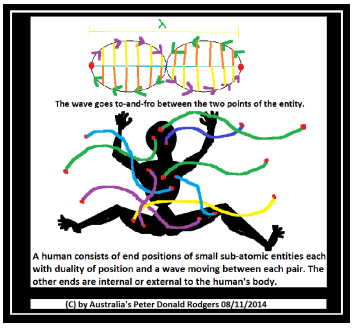
$$\psi^2 = [(\sin^2(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\sin\gamma\sin\eta + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2}))$$
$$+(\sin^2(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\sin\gamma\cos\eta + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2}))$$
$$+(\sin^2(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\cos\gamma + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2}))].$$

But $[\sin^2(x) = (½)(1-\cos(2x))]$ simplifies ψ^2 mathematics.

RODGERS COMPLEX IRREVERSIBILITY EQUATION:

$$\psi^2 = [((1/2)(1-\cos(2(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\sin\gamma\sin\eta + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2})))$$
$$+((1/2)(1-\cos(2(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\sin\gamma\cos\eta + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2}))$$
$$+((1/2)(1-\cos(2(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\cos\gamma + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2}))].$$

$$[\delta^2/(\delta(r_a\sin\gamma\sin\eta(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1}))^2 + \delta^2/(\delta(r_a\sin\gamma\cos\eta(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1}))^2$$
$$+ \delta^2/(\delta(r_a\cos\gamma(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1}))^2 + \delta^2/(\delta(c_at_a(\alpha_a\phi_a\xi_a)3^{-1/2}))^2](\psi^2)$$
$$= 2\cos(2(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\sin\gamma\sin\eta + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2})$$
$$+ 2\cos(2(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\sin\gamma\cos\eta + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2})$$
$$+2\cos(2(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\cos\gamma + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2})$$
$$-(1/6)\cos(2(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\sin\gamma\sin\eta + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2})$$
$$-(1/6)\cos(2(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\sin\gamma\cos\eta + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2})$$
$$-(1/6)\cos(2(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\cos\gamma + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2})$$
$$= (7/3)\psi^2 - (7/2).$$



ENTANGLEMENT EXISTS

The macroscopic formula seems to be Ms while the microscopic formula seems to be sin(s). The Klein-Gordon Equation seems far from correct because of the vectors that are ignored in its formulation, and because the Klein-Gordon Equation is for a universe of reversible events with time, while the universe consists of irreversible events with time. I attempted to find the solution by thinking about the limit of (sinD)/D = 1 as D goes to zero. I could not find a solution for A until I suddenly tried the Entanglement concept. I discovered that

Limit $\sin((M_Bs_B - M_As_A)^2)/((M_Bs_B - M_As_A)^2) = 1$,

as $((M_Bs_B - M_As_A)^2)$ goes to zero.

Consequently, the microscopic formula should be using

$$\sin((M_Bs_B - M_As_A)^2).$$

And the macroscopic formula should be using

$$((M_Bs_B - M_As_A)^2).$$

In simple coordinates, approximately,

$$(M_Bs_B - M_As_A)^2$$
$$= [(M_Bx_{B1} + M_Bict/3^{1/2} - M_Ax_{A1} - M_Aict/3^{1/2})^2$$
$$+ (M_Bx_{B2} + M_Bict/3^{1/2} - M_Ax_{A2} - M_Aict/3^{1/2})^2$$
$$+ (M_Bx_{B3} + M_Bict/3^{1/2} - M_Ax_{A3} - M_Aict/3^{1/2})^2]$$

In polar coordinates,

$$(M_Bs_B - M_As_A)^2$$
$$= [(M_B\, r_B(\alpha_B^{-1}\phi_B^{-1}\xi_B^{-1})\sin\gamma\sin\eta + M_Bic_Bt_B(\alpha_B\phi_B\xi_B)3^{-1/2}$$
$$- M_Ar_A(\alpha_A^{-1}\phi_A^{-1}\xi_A^{-1})\sin\gamma\sin\eta + M_Aic_At_A(\alpha_A\phi_A\xi_A)3^{-1/2})^2$$
$$+ (M_B\, r_B(\alpha_B^{-1}\phi_B^{-1}\xi_B^{-1})\sin\gamma\cos\eta + M_Bic_Bt_B(\alpha_B\phi_B\xi_B)3^{-1/2}$$
$$- M_Ar_A(\alpha_A^{-1}\phi_A^{-1}\xi_A^{-1})\sin\gamma\cos\eta + M_Aic_At_A(\alpha_A\phi_A\xi_A)3^{-1/2})^2$$
$$+ (M_B\, r_B(\alpha_B^{-1}\phi_B^{-1}\xi_B^{-1})\cos\gamma + M_Bic_Bt_B(\alpha_B\phi_B\xi_B)3^{-1/2}$$
$$- M_Ar_A(\alpha_A^{-1}\phi_A^{-1}\xi_A^{-1})\cos\gamma + M_Aic_At_A(\alpha_A\phi_A\xi_A)3^{-1/2})^2]$$

RELATIVISTIC VOLUME

When I was sixteen, I wanted to know what the equation for relativistic volume is. Unfortunately, I blamed my hardworking, intelligent teacher of ignorance when he did not know the answer. The truth is that it is a very difficult question to answer. During my life, I have struggled with, and scribbled out ideas and answers for this problem several times. In the past, I have considered only the situation of reversible events with time mathematics. On this occasion, I also consider the situation of irreversible events with time mathematics. The mathematics that I now give for reversibility of events with time is equivalent to what I scribbled out about forty years ago.

REVERSIBILITY-OF-EVENTS-WITH-TIME VOLUME EQUATION

In Calculus, the volume of a region D in R3 is given by a triple integral of the constant function f(x,y,z) = 1 and, for the 4-dimensional situation of Special Relativity, is usually written as

$$\int\int\int (1)\delta x\delta y\delta z \text{ . Volume} = V = xyz.$$

IRREVERSIBILITY-OF-EVENTS-WITH-TIME VOLUME EQUATION

For the 3-dimensional situation of my irreversibility geometry, the volume can be written as

$$\int\int\int (1)\delta(x+3^{-1/2}ict)\ \delta(y+3^{-1/2}ict)\ \delta(z+3^{-1/2}ict) \text{ .}$$

More thoroughly in polar coordinates, the volume is:

$$\int\int\int (1)\ (\delta(r_a)(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\sin\gamma\sin\eta+3^{-1/2}i\delta(ct)(\alpha_a\phi_a\xi_a))$$
$$(\delta(r_a)(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\sin\gamma\cos\eta+3^{-1/2}i\delta(ct)(\alpha_a\phi_a\xi_a))$$
$$(\delta(r_a)(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\cos\gamma+3^{-1/2}i\delta(ct)(\alpha_a\phi_a\xi_a)) \text{ .}$$

If irreversibility of events with time, this could provide cosmologists with a useful equation for deciding whether expansion or shrinking of the universe is accelerating.

NAVIER-STOKES EQUATION

The general UNIVERSAL CONSERVATION EQUATION FOR REVERSIBLE EVENTS WITH TIME gives the conservation of momentum and energy equations presently used by physicists. The Navier-

Stokes Equation of Fluid Dynamics comes from the current conservation equations. Therefore, the Navier-Stokes Equation may be derived from the general UNIVERSAL CONSERVATION EQUATION. The NAVIER-STOKES EQUATION: the sum of the gravitational force, the pressure force, and the viscous force is equal to the mass by acceleration. When simplified for a similar situation, the general UNIVERSAL CONSERVATION EQUATION, whether the equation for reversible or the equation for irreversible events with time, leads to mathematics of the gravitational force, the pressure force, a wave force, a Coulomb force, and a mass by acceleration force. Some of these forces are added to be the viscous force. For further in-depth mathematical analysis of the fluid dynamical system, I can apply any member of the family of this general equation.

CONCLUSION

Over the course of eons, humans have advanced step by step. Here, I hope to have contributed a small piece toward our scientific goals; this small improvement vision which spans, by way of specific mathematics, across many areas which are not so distantly related as people have believed. The few equations offered here may yet aid in our more complete understanding of a proper unified field theory, a more full understanding of fluid dynamics, of geometry itself, of black holes and super-massive objects, of time, and of the conservation laws. Now, physicists might be better equipped to decide whether the volume of our universe is expanding or shrinking. My three major equations in this paper are these:

I expanded upon the famous Schwarzschild's Equation for the bending of a light-ray passing our Sun.
From that equation, and current conservation equations, I created UNIVERSAL CONSERVATION EQUATION FOR REVERSIBLE EVENTS WITH TIME. After that, I discussed the possibility of irreversible events with time due to my alternative equation. If correct, irreversibility means that the UNIVERSAL CONSERVATION EQUATION would be modified. The most major breakthrough in this paper is my mathematical explanation of how macroscopic and microscopic formulae come from ENTANGLEMENT.

PROGRESSION OF PAPERS BY PETER DONALD RODGERS:

1. **'Beyond Albert Einstein's Relativity: UFT Physics', 2008 & revised 2011.**
2. **'Einstein Wrong: UFT Physics'', 2013.**
3. **'Could Albert Einstein's Special Relativity Be Correct?', 15th June 2014, in Mind Magazine,**
4. **'Do Stephen Hawking's Black Holes Exist?', 13th July 2014, in Mind Magazine,**
5. **'No Hawking's Black Hole', 19th July 2014, in Mind Magazine,**
6. **'Relativity Black Hole Truth', 29th July 2014, in Mind Magazine.**
7. **'Navier-Stokes Physics', 2nd August 2014, in Mind Magazine.**
8. **'NAVIER-STOKES EQUATION', 4th August 2014, in Mind Magazine.**
9. **'WHY NAVIER-STOKES EQUATION', 7th August 2014**
10. **'RELATIVITY TO NAVIER-STOKES EQUATION', 26th September 2014.**
11. **'RELATIVITY TO IRREVERSIBILITY '. 28th October 2014.**
12. **'ENTANGLEMENT EXISTS', 12th November 2014.**

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www.mindmagazine.net/#!peter-donald-rodgers-the-new-relativity/cuxb/

… Thanks to Australia's Dr Jason Betts, of World Genius Directory, for assessing my intelligence and often encouraging me to use my intelligence. www.psiq.org

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… Thanks to poet Anja Jaenicke for years of encouragement for my creativity and laughter.

DEFINITIONS

$\sum$ = summation of
c = velocity-of-light in a vacuum
c_a = velocity-of-light at centre-of-mass of particle a relative to centre-of-mass of the entire system
c_{ao} = velocity-of-light at centre-of-mass of particle i_o relative to centre-of-mass of the entire system
E = energy of wave-particle
G = gravitational constant
h = Planck's constant
M = mass of wave-particle relative in observer it to the c-of-m of the whole system
M_a = mass of wave-particle a relative in observer it to the c-of-m of the whole system
M_{ao} = mass of wave-particle io relative in observer it to the c-of-m of the whole system
M_o = mass of wave-particle o relative in observer it to the c-of-m of the whole system
N = number of atoms
n_a = orbital of a
n_b = orbital of b
P = pressure
Q_a = charge on wave-particle a
Q_b = charge on wave-particle b
r_a = radial distance from the c-of-m of wave-particle a to c-of-m of the whole system
r_{ab} = radial distance from the c-of-m of wave-particle a to c-of-m of wave-particle b
r_{ao} = initial radial distance from the c-of-m of wave-particle a to c-of-m of the whole system
t_a = time relative to an observer at the c-of-m of the whole system
t_{ao} = initial time relative to an observer at the c-of-m of the whole system
v = velocity of wave-particle relative to an observer at the c-of-m of the whole system
V = volume
v_a = velocity of wave-particle a relative to in observer at the c-of-m of the whole system
v_{ao} = velocity of wave-particle a_o relative to an observer at the c-of-m of the whole system
V_{Ma} = volume of mass a
V_{Mao} = volume of mass a

v_{rms} = velocity of atoms relative to an observer at the c-of-m of the whole system
V_{Ta}= total volume
V_{Tao}= total volume
x_a = position in x-direction of a
x_b = position in x-direction of b
γ_a = simplificition of gravitational effects on a
γ_b = simplificition of gravitational effects on b
δ = change of
ε_0 = electrical permittivity in a vacuum
θ_a = angle moved in θ direction a
θ_b = angle moved in θ direction b
λ_a = wavelength of wave-particle a
λ_b = wavelength of wave-particle b
μ_0= magnetic permeability
Π = pi
Ω_a = angle moved in Ψ direction a
Ω_b = angle moved in Ψ direction b

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