

PHYSICS IN THE 21st CENTURY - By Glenn A. Baxter, P.E.*

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ABSTRACT

We present a free physics textbook intended for an advanced college or university seminar course at the undergraduate or graduate levels. This physics text is also intended for post doctoral and independent physics researchers . A new theory/model of the atom is covered as well as relativity, electromagnetic radiation, probability, quantum electrodynamics, and thermodynamics. (94 pages, 5.11 MB)

*The complete papers of Glenn A. Baxter, P.E.** - www.k1man.com/c1-6, www.k1man.com/c1, www.k1man.com/c2, www.k1man.com/c3, www.k1man.com/c4, www.k1man.com.c5, www.k1man.com/c6, www.k1man.com/c7, and www.k1man.com/c1-7

INTRODUCTION

Physics in the 21st century is a science laced with uncertain thinking and analysis, unlike more exact macro science such as electrical engineering. Electrical engineers know many of the behaviors that things they refer to in a limited way such as electrons do and don't particularly care what electrons actually are.

Maxwell showed mathematically that there should be electromagnetic radiation which would travel at the known speed of light. Hertz generated radio wave electromagnetic radiation, and scientists jumped to the conclusion that light and radio waves are the same thing. Many things are glossed over.

What causes the radiation? One "cause" seemed to be an electron dropping from an "orbit" of higher energy to lower energy with a somehow resulting wave length being found from $e = hf$ where f is the frequency and therefore the wavelength being calculated from $\lambda = c/f$. Now with a radio wave, an alternating current is imposed on an antenna wire, and scientists then jump to talk about the radio wave $\lambda = c/f$ where f is the frequency of the alternating current so imposed on the antenna wire. But what causes that radiation? Is it caused by the electrons in the wire accelerating and decelerating inside the wire or is the radiation caused by electrons in the metal wire changing energy levels? In such case there are two wavelengths, one being of the radiation itself of a frequency calculated by $e = hf$

caused by the energy level changes on antenna metal atoms and the other being and undulation of radiation total intensity which is synchronous with the frequency if the alternating current imposed on the antenna wire.

Does a moving electron radiate? Moving relative to what? If you are riding along with a “moving” electron, does it radiate? Or does only an accelerating electron radiate? And just how is acceleration related to gravity? Contrary to Dr. Einstein, acceleration and gravity are not equivalent. See www.k1man.com/c4

Then there is radiation (X-rays and Gamma rays) of much higher energy and thus shorter wavelength which seems to be generated in the nucleus rather than in the “outside” electron “shells.” How is this radiation different? See www.k1man.com/c2

Incomplete theory seemed to predict that metal glowing red (when placed in a forge) should emit large amounts of radiation at higher energy and therefore shorter wavelengths, but this does not happen. This mystery was solved by making the quantum energy assumption which led to the weird science of quantum physics, which Nobel Laureate, Dr. Richard Feynman, said quite correctly that nobody understands. Certainly nobody understands how Santa Clause can possibly squeeze down our chimneys either.

Maxwell believed that electromagnetic radiation “waves” in empty space need some medium to travel through (called ether) and said that “...there can be no doubt that the interplanetary and interstellar spaces are not empty, but are occupied by a material substance or body which is certainly the largest, and probably the most uniform body of which we have any knowledge...” Michelson and Morley showed in 1887 that such a proposed ether does not exist. This electromagnetic radiation travels on its own, and this led to Dr. Einstein reintroducing the Newton hypothesis that these waves are actually particles, now called photons. Experiments then showed that these photons sometimes act like particles and sometimes act like waves; this apparent contradiction being at the crux of the mystery of modern quantum physics theory and Dr. Feynman’s statement that nobody understands it.

With the discovery of the positron, or positive electron, it appeared that a positron and electron could come together and annihilate each other and thus convert matter into two photons of electromagnetic energy. See www.k1man.com/c2 Also, a photon of electromagnetic energy could crash into a proton, change the proton’s momentum, and increase the photon’s wavelength in the process. There seems to be a complicated relationship and interchangeability between mass and energy. This writer says that, contrary to Dr. Einstein, this relationship is not quite so simplistic as his famous formula $E = MC^2$. See www.k1man.com/c4

Also, electrons seemed to be able to somehow travel through materials in a complex way and even sometimes without encountering any resistance as when the material is very cold.

CHAPTER 1

NOT SO FAST, DR. EINSTEIN, by Glenn A. Baxter, P.E.*

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ABSTRACT:

The Special Theory of Relativity is disproved here using simple high school algebra and we reference experimental proof from NASA. The theory of relativity is LACED throughout and therefore clouds modern scientific thinking. As with Aristotle's theory about everything being made of earth, air, fire, and water, or that a heavier canon ball will fall to earth faster than a lighter wooden ball, said theories standing for over 2000 years, Dr. Einstein's Special Relativity is also wrong and has stood intact for over 100 years.

CONTENT:

Albert Einstein's name and his likeness are the most recognizable "trade marks" on earth today, which surpass other most popular recognizable things such as "the Beatles" or "Coca Cola." "The Beatles" is synonymous with "music" and "Coca Cola" is synonymous with "drink." "Einstein" is synonymous with "genius." Stop a stranger on the street and ask "Who was the smartest man who ever lived?" The reply will be "Einstein." "Why?" you ask. "Because of his theory of relativity" will come the reply.

The theory of relativity is LACED throughout modern scientific thinking. See, for example, the article about time in the June, 2010 issue of Scientific American or 2004 Physics Nobel Laureate Frank Wilczek's book The Lightness of Being, published in 2008. (See www.frankwilczek.com) As with Aristotle's theory about everything being made of earth, air, fire, and water or that a heavier canon ball will fall to earth faster than a lighter wooden ball, said theories standing for over 2000 years, Dr. Einstein's Special Relativity is also wrong and has stood intact for over 100 years.

Dr. Einstein argued that light in the Michelson-Morley experiment (focusing on that leg which travels at a right angle to the direction of relative motion) appears to an observer standing "still" to travel further

than it appears to a second observer moving relative to the first. The speed of light c would be c equals distance observed by either observer to be travelled divided by the time for travel measured by either observer. Dr. Einstein then wrongly postulated that the speed of light, measured by any observer, is always constant. Since the two observers see different apparent distances, then, if the speed of light is constant, time measured by each observer must therefore “flow” at different rates.

From here, Dr. Einstein (derives other equations and) concludes, for example, that this relative motion “causes” mass to increase as well as being equivalent to energy as indicated by his most famous equation $E = MC^2$.

Engineer Glenn Baxter shows (with straightforward high school algebra) in his article, Not So Fast, Dr. Einstein, that Dr. Einstein’s assumption about the constant light speed and his ensuing mathematics lead to the contradiction of time both slowing down and speeding up simultaneously, which, of course, is not possible. Further, when particles were collided with each other at the CERN laboratory near Geneva through the 1990s, a typical collision of electrons and positrons produced 10 pions, a proton, and an antiproton, with what coming out weighing thirty thousand times more than what went in. Thus there are reasons for mass to increase other than Dr. Einstein’s Special Relativity uniform motion.

In his article, Mr. Baxter corrects these monumental errors by Dr. Einstein and then goes on to correctly derive $E = MC^2$, which is a special case of electron – positron annihilation creating photons (light). Mr. Baxter shows that the relation between mass and energy is much more complicated than Dr. Einstein’s simple mathematical inherent energy of mass, as suggested by $E = MC^2$. Physics Nobel Laureate, Dr. Frank Wilczek, even (frequently) raises this equation to the misleadingly lofty and universal status of “Einstein’s Second Law.” Mr. Baxter then derives the equations which address the central idea of General Relativity, which is the effects of gravity on mass-less photons or light.

NOT SO FAST, DR. EINSTEIN – PART IA

By

Glenn A. Baxter, P.E.*

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(See also the February 1963 Scientific American article “The Clock Paradox” by J. Bronowski)

Dr. Einstein looked at various experiments with light and then postulated that its speed is constant relative to any observer(1), but since measurement of light speed is direction sensitive, a measurement in a particular direction can actually give a larger value for the speed of light and a smaller speed in the reverse direction(A). As Dr. Einstein looked at only one of these larger measurements, as represented in the Lorentz transformations, and given his postulate that the speed of light is always constant relative to any observer, his logical explanation of the apparent discrepancy was that time must have slowed

down for the object that is in motion. From this incomplete analysis, he developed all of the mostly incorrect elements of the Special Theory of Relativity(4).

Dr. Einstein was ingenious in examining the various ramifications of relative motion, just as Darwin was ingenious in examining the ramifications of natural selection, but when examining relative motion we must be much more formal and rigorous in nailing down motion directions and what is moving where and relative to what.

Part of the confusion stems from the manner in which light (which has no mass and yet has both particle like and wave like characteristics) moves from one place to another. A baseball thrown forward by a boy or girl on a flat railroad car travelling, say, ten miles per hour due North, will travel ten miles per hour faster in the due North direction than another baseball thrown with the same intensity in the same direction by a friend standing on the ground by the tracks. The two speeds are additive.

If, instead, the youngsters are pulsing a flashlight beam (at night, of course!) instead of throwing a baseball, the simultaneous light pulses, Dr. Einstein argued, of both flashlights will arrive at a forward overpass at exactly the same time. He argued that the speeds are not additive. The pulse from the rail car will be Doppler effect "blue shifted" (higher frequency and thus higher energy) compared with the pulse originating on the ground. The baseball carries its higher energy in its higher speed, and the light carries its higher energy in its higher frequency, consistent with Dr. Planck's famous relation saying that Energy = (frequency)(Planck's constant). More later about this Doppler shift which turns out to be composed of two components related to both increasingly shorter distances travelled by the light as the train moves along, and a MEASURED increase in light velocity relative to the overpass. (This paragraph was modified on 19 May 2010).

Let us perform a thought experiment and synchronize two clocks, one on the train measuring time t and one on the train platform measuring time t' . I am sitting on the train platform, and my time is "prime time." Let t be the elapsed time for a flashlight pulse on the rail car to reach the front of the car. Suppose the train is traveling at speed v instead of 10 miles/hour. $v = s/t'$ where s is the distance travelled over the ground and t' is the elapsed time. Solving for s by cross multiplication gives $s = vt'$. Suppose I am sitting on the train station platform, and we will call this being "at rest." The flashlight is at the exact middle of the car which is, say, 2 times d long. For the person on the car the speed of light is $c = d/t$. For me at the train station the train appears to be running away from the light and the speed of that light seems to be faster or d plus the distance the car has moved during time t' , all divided by t' , the elapsed time it took for the light to reach the front of the car, or $c' = (d + vt')/t'$. For me on the train platform, the light pulse certainly appears to have travelled further in the same amount of time and is therefore faster. Dr. Einstein makes a huge leap at this point. Since he postulated that the speed of light is always CONSTANT relative to ANY observer, his "logical" explanation for the above apparently different results for the measurement of the speed of light is that time on the train must have "slowed down" compared with time for me on the train platform(2).

But, as stated above, measurement of the speed of light is direction sensitive. If, instead, the light is flashed toward the back of the car, then the car appears to be catching up to the light, and the speed of light is again measured on the car as $c = d/t$, but on the platform I measure the speed of light as $c' = (d - vt')/t'$, and solving as below in (2) now gives $t = t' / (1 - vt'/d)$ or $t > t'$, and now time appears to have "speeded up" on the train. Obviously time and a clock cannot simultaneously both speed up and slow down. Indeed, in this case, if v or the train reaches the speed of light, then $vt' = d$ and therefore $t =$

$t'/0$, and time would be flowing infinitely faster rather than at half speed as shown in (2) below on the very same train.

Dr. Einstein measured the speed of light on the train from one side of the train to the other (as described in the February 1963 Scientific American article "The Clock Paradox" by J. Bronowski) compared with the speed of the same light pulse as measured by me on the train platform. This sets up a right triangle where the Pythagorean Theorem and simple algebra (3) now calculate time "slowing down" to the tune of:

$$t = t' \sqrt{1 - v^2/c^2}$$

This is the exact relationship that Dr. Einstein arrived at and used as his corner stone for the Special Theory of Relativity as presented in his famous 1905 paper(4). His slowing of time gives yet a different direction sensitive magnitude of time slowing indicated in the above relationship:

$$t = t' / (1 + vt'/d)$$

If the train or if v reaches the speed of light in Dr. Einstein's formula, then time on the moving train slows to zero and thus stops altogether, leading to his "logical" conclusion that therefore nothing can reach, much less exceed, the speed of light. This cosmic speed limit proposed by Dr. Einstein for everything being that of the speed of light is, therefore, also brought into question by this writer. So far, we have seen three different formulas for three different light directions which have time or the clock on the train running half as fast, then infinitely faster, and finally stopped or flowing at a rate of zero. There are an infinite number of other directions other than 0, 90 (used by Dr. Einstein), and 180 degrees already used where the "slowing down" of time has a range of zero to half as fast to infinitely faster. All three formulas already seen and all measurements in the infinitely other directions are all incorrect since they all have the same clock on the train simultaneously slowing down or speeding up at different rates.

From the platform I could have measured the speed of light making a round trip, both forward and backwards from the middle, and the results would then be identical with the measurement made on the train(5). Round trip calculations with Dr. Einstein's formula(3) still comes up with time appearing to slow down since light does not change direction with respect to motion of the rail car travelling at 90 degrees to the direction of the light pulses.

Contrary to Dr. Einstein, clocks do not speed up or slow down due to relative motion of the clocks. In his famous 1905 paper(4), Dr. Einstein incorrectly stated:

".....Thence we conclude that a balance clock at the equator must go more slowly, by a very small amount, than a precisely similar clock at one of the poles under otherwise identical conditions."

So, the clock on the train appears to slow down or speed up depending on which method of calculation is used as directed by the direction of the light being measured when relative motion is involved. The Pythagorean method of Dr. Einstein through his "off the shelf" application of the Lorentz transformations, as discussed in the 1963 Bronowski Scientific American article(6), with its squares, as used by Dr. Einstein, locked him in to time only slowing down and thus neglecting all the legitimate

other measurements where time appears slow down at different rates or even speed up. The fact is that time neither slows down or speeds up, and therefore Dr. Einstein based much in his famous theories (that supposedly revolutionized classical physics) on a fairly simple yet major error in his original 1905 paper(4). Dr. Einstein's critical error was groping at the already existing Lorentz transformations in his analysis of light at only 90 degrees and then rushing ahead too quickly with his theories. Just as Aristotle had us all believing for two thousand years that all matter consisted of earth, air, fire and water, and that a heavy shot put would fall faster than a lighter golf ball, both Dr. Einstein and Aristotle were human and both were capable of making some fundamental errors.

Galileo had the presence of mind to climb the Leaning Tower of Pisa and drop the two different balls to see what would really happen, and Lavoisier was quite a bit more sophisticated when working in his chemistry laboratory to debunk the earth, air, fire and water model of all things. What if the tower at Pisa had been built "properly" and did not lean? Would Galileo have made his famous discovery? One tiny mistake of a leaning tower compensated for a huge mistake made by Aristotle. Here, a tiny mistake by Dr. Einstein may have caused huge mistakes by scientists who are too busy to check out the mundane fundamentals underpinning the theories of relativistic motion.

In summary, the speed of light is, indeed, constant, but will APPEAR to speed up, or slow down, or stay the same, depending on how the measurement is made between two moving platforms. Time is also constant in the abstract sense of being something that "flows" forward and is a quantity used as a parameter to describe physical events such as motion, where motion or velocity is defined as distance divided by time. But time can only be compared to other time such as "how long" it takes the earth to make a single rotation. Time is not a fundamental entity in nature, as suggested by Dr. Einstein, that slows down or speeds up, but is rather a derived quantity that can be used to compare things that happen in the universe. As such, if time did not exist, the universe would have to stop in the sense that if the universe were nothing more than an endless vacuum, there would be no entity or entities to exhibit the "thing" that time is.

Consider this: If the universe was an empty vacuum and time therefore did not exist, would the Pythagorean Theorem exist? Yes it would! Things like the laws physics cannot be eliminated with the same ease with which something like time can be eliminated. Thus the Pythagorean Theorem and all the laws of physics are arguably and through definition in the "spiritual" domain while time is in the physical domain. Dr. Einstein seems to have put time in the wrong domain.

- (1) For example, light from a binary star system when each star is equal distance from us, with one star moving away from us and the other moving toward us, is postulated to arrive at exactly same time.(A)

(A) This sentence was modified on 11 July 2010 and again on 26 September 2010.

- (2) If t' is time for me on the platform and t is time as measured on the train, then $c' = (d + vt')/t'$, and $c = d/t$ so that if $c' = c$, namely if the speed of light is constant (and always MEASURED constant – IT IS NOT) relative to any observer, then $(d + vt')/t' = d/t$ or by cross multiplication $t(d + vt') = dt'$ so that $t = dt'/(d + vt')$ and therefore $t = t'/(1 + vt'/d)$ or $t < t'$, so that time appears to have slowed down on the train (or the clock on the train must have slowed down

compared with my clock on the platform). If v reaches the speed of light, then $vt' = d$ and therefore $t = t'/2$ or time would be flowing half as fast on the moving train.

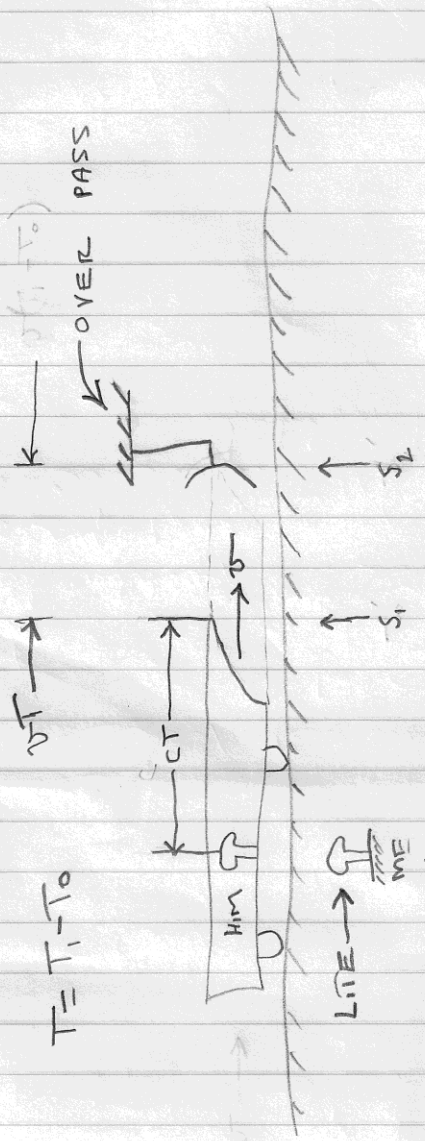
- (3) Construct a right triangle ABC with the right angle at B. C is toward the front of the train car and B is at the side of the car nearest the train platform. A is directly opposite B on the other side of the train car. Light on the car is flashed from A to B. t is the time it takes the light to travel from A to B. Let the distance AB be $d = ct$ where c is the speed of light. BC is the distance travelled by the train car as perceived by me $= vt'$. The distance traveled by the light as perceived by me is the hypotenuse AC of this right triangle $= d' = ct'$. Using the Pythagorean Theorem for a right triangle, AB squared plus BC squared = AC squared or ct squared + vt' squared = ct' squared. Solving this using high school algebra gives:

$$t = t' \sqrt{1 - v^2/c^2}$$

- (4) ON THE ELECTRODYNAMICS OF MOVING BODIES by A. Einstein, "Zur Elektrodynamik Bewegter Körper," Annalen der Physik, 17, 1905.
- (5) $v = s/t'$, and by cross multiplication, $s = vt'$. The fundamental issue is that the apparent distances travelled by the light are different on the train and as perceived on the train platform. On the train car the round trip distance is $d + d + d + d = 4d$. As measured on the train platform, the distances are $d + vt' + d - vt' + d - vt' + d + vt' = 4d$. Thus, since the distances are the same, then $t = t'$ and time neither slows down or speeds up.
- (6) February 1963 Scientific American article "The Clock Paradox" by J. Bronowski
- (7) RELATIVITY FOR THE LAYMAN by James A. Coleman, Signet, New York, 1958

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Fig 1



$$v = \frac{c}{T} \quad S = vT \quad S_0$$

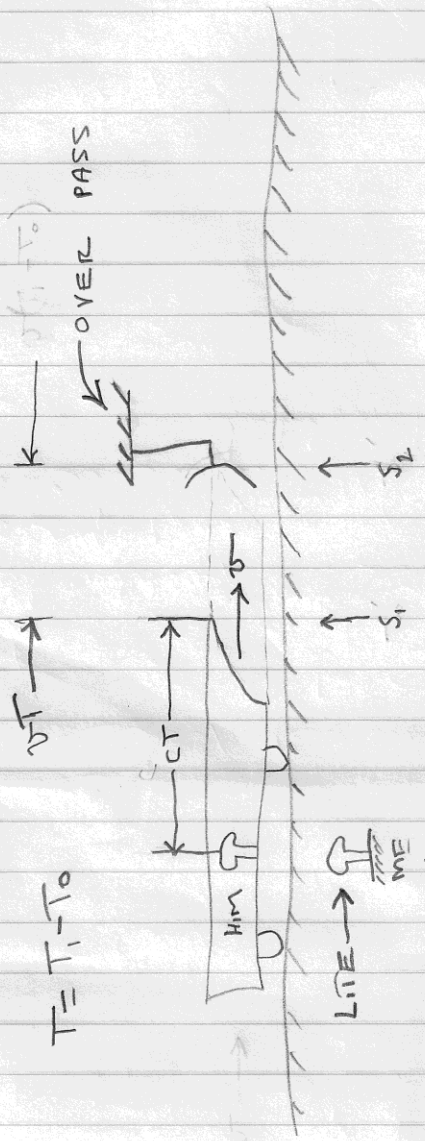
My Time is prime Time. When my lite reaches S_1 , his lite reaches S_2 . He measures $C = \frac{CT}{T} = C$. I measure his lite

$$C = \frac{CT + vT}{T} = C + v$$

I also measure two blue shifts.

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Fig 1



$$v = \frac{c}{T} \quad S = vT \quad S_0$$

My Time is prime Time. When my lite reaches S_1 , his lite reaches S_2 . He measures $C = \frac{CT}{T} = C$. I measure his lite

$$C = \frac{CT + vT}{T} = C + v$$

I also measure two blue shifts.

NOT SO FAST, DR. EINSTEIN – PART II

By

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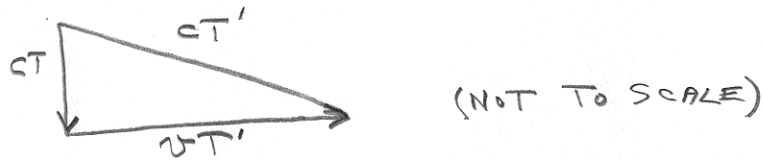
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Described in this writer's 10 December 2008 paper entitled "NOT SO FAST, DR. EINSTEIN," now designated as "NOT SO FAST, DR. EINSTEIN – PART I," was the conclusion by Dr. Einstein that relative motion "causes" time to slow down (dependent on the remarkable property of light having constant speed) which was not consistent with time simultaneously "speeding up" in that moving rail car thought experiment. Dr. Einstein's formula for this:

$$T = T' \sqrt{1 - v^2/c^2}$$

Where t is time passing on the rail car, t' is time passing on the train platform, v is velocity of the train, and c is the speed of light

turns out to be a special case of relative motion where light is travelling from the far side of the rail car toward the near side of the rail car and also toward me (my time is "prime" time) sitting on the train platform on the near side with the train travelling perpendicular to the light and also going from left to right. To make the transformation between the Cartesian coordinate system on the "moving" rail car and the Cartesian coordinate system on the "stationary" train platform, a right angle "special case time transformation triangle" was used:



Special Case Time Transformation Triangle

Since velocity is distance/time and therefore distance = velocity times time, ct on the "special case time transformation triangle" represents the distance that light has travelled across the rail car in time t in the rail car coordinate system, vt' represents the distance travelled by the train in my train platform Cartesian coordinate system, and ct' is the resultant and apparently longer distance "actually" travelled

in my train platform Cartesian coordinate system. Dr. Einstein incorrectly assumed that the speed of light c of ct is equal to the speed of light c of ct' , since the actual speed of light is constant. The speed of light IS constant, but in this coordinate transformation, the speed of light c of ct IS NOT equal to the speed of light c of ct' . Since the distance ct' in the platform coordinate system is clearly greater than the distance ct in the rail car coordinate system, Dr. Einstein assumed that in view of his postulate that the speed of light is always constant, the discrepancy is explained by concluding that time must have slowed down on the moving train. Wrong! Light travels the longer distance ct' in the SAME amount of time because light only APPEARS to me on the train platform to be faster. IT ISN'T FASTER. Relative motion only causes it to appear to me on the train platform to be faster.

However, using Dr. Einstein's incorrect reasoning that c of ct and of ct' are both the same and that therefore it must be that t slows down when relative motion is involved, we solve the special case time transformation triangle with the Pythagorean theorem as follows:

$$\begin{aligned}
 c^2 T'^2 + v^2 T'^2 &= c^2 T^2 \\
 c^2 T^2 &= c^2 T'^2 - v^2 T'^2 \\
 T^2 &= T'^2 - \frac{v^2 T'^2}{c^2} \\
 T^2 &= T'^2 \left(1 - \frac{v^2}{c^2}\right) \\
 T &= T' \sqrt{1 - \frac{v^2}{c^2}}
 \end{aligned}$$

This is Dr. Einstein's famous equation predicting that relative motion causes time to slow down. As seen in Part I, changing the direction of ct will cause time to simultaneously slow down at different rates and even speed up at different rates which is, of course, impossible.

Continuing with Dr. Einstein's fundamental error described above, let's derive his most important other relativity formulas such as:

$$m' = \frac{m_0}{\sqrt{1 - \frac{v^2}{c^2}}}$$

Where m_0 is "rest" mass and m' is the apparently "increased" mass caused by relative motion

which predicts that relative motion causes mass m in the "moving" coordinate system to increase, and:

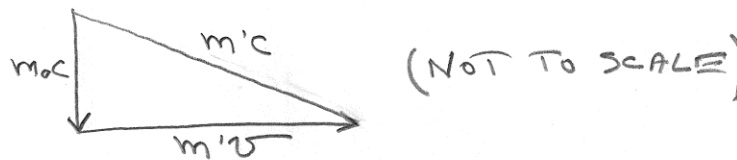
$$E = mc^2$$

which calculates an exact interchangeable relationship between mass and energy. The first formula:

$$m' = \frac{m_0}{\sqrt{1 - \frac{v^2}{c^2}}}$$

is described by Dr. Richard P. Feynman (1965 Nobel Prize in physics) in his famous 1961 – 1962 Cal Tech physics lectures (8): "...For those who want to learn just enough so they can solve problems, (this formula) is all there is to the theory of relativity – it just changes Newton's laws by introducing a correction factor to mass.....":

This time we use a "special case momentum transfer triangle":



Special Case Momentum Transfer Triangle

Using the same train thought experiment, we now look at momentum which is defined as mass times velocity. We know that massless light photon particles impart velocity and thus momentum to electrons when "crashing" into them. After the "crash," light correspondingly loses the momentum energy thus transferred as measured by Dr. DeBroglie to be longer wavelength where light energy is $E = hc/\lambda = hf$, where f is the particular light frequency and λ is the particular light wavelength.

On the "special case momentum transfer triangle," m_0 is a hypothetical "rest" mass particle travelling from the far side to the near side of the rail car at a hypothetical speed of light just as the light flash was travelling before on the "special case time transformation triangle." $m'v$ is the momentum imparted to the particle by the train's velocity and $m'c$ is the resultant momentum, both being in the train platform coordinate system.

Again, using Dr. Einstein's incorrect reasoning that c in $m'c$ and c of $m_0 c$ are both the same and that therefore it must be that m changes when relative motion is involved, we solve this "special case momentum transformation triangle" with the Pythagorean theorem as follows:

$$m_0^2 c^2 + m'^2 v^2 = m'^2 c^2$$

$$m_0^2 c^2 = m'^2 c^2 - m'^2 v^2$$

$$m_0^2 = m'^2 - \frac{m'^2 v^2}{c^2}$$

$$m_0^2 = m'^2 (1 - v^2/c^2)$$

$$m_0 = m' \sqrt{1 - v^2/c^2}$$

$$m' = \frac{m_0}{\sqrt{1 - v^2/c^2}}$$

This is the famous and fundamental "Dr. Einstein" relativity formula, and, to repeat for important emphasis, is what Dr. Feynman described in his 1961 - 1962 lectures as "...For those who want to learn just enough so they can solve problems, (this) is all there is to the theory of relativity - it just changes Newton's laws by introducing a correction factor to mass.....":

Just as with the light flash on the train, we could have changed the direction of the particle and therefore come up with different "changes" to mass as "caused" by relative motion. Thus, we see that we have massive problems continuing with special relativity theory.

Dr. Einstein continued further with

$$m' = \frac{m_0}{\sqrt{1 - v^2/c^2}}$$

$$m_0 = m' \sqrt{1 - v^2/c^2} = m' (1 - v^2/c^2)^{-1/2}$$

Expanding this with the binomial theorem gives

$$m_0 = m' \left(1 + \frac{1}{2} v^2/c^2 + \frac{3}{8} v^4/c^4 + \dots \right)$$

This series rapidly converges when v is small so that the terms after the second or third are negligible so that

$$m_0 \cong m' + \frac{1}{2} m' v^2 \left(\frac{1}{c^2} \right)$$

Multiplying both sides by c squared gives:

$$m_0 c^2 = m' c^2 + \frac{1}{2} m' v^2 + \dots$$

Dr. Einstein interpreted the first term to the right of the equal sign to be part of the total energy of a mass or intrinsic "rest mass" and the next term to be ordinary kinetic energy. Thus is derived from an incorrect use of the constant speed of light in the momentum transfer triangle is Dr. Einstein's most famous equation:

$$E = mc^2$$

We do know that all particles have anti particles which turn into pure DeBroglie electromagnetic energy when particles and anti particles come together. Thus, although

$$E = mc^2$$

or some such conversion between mass and energy or between momentum and $E = hf$ electromagnetic energy is certainly desirable,

$$E = mc^2$$

appears to be incorrect and also much too simplistic to adequately describe what is really going on here.

Enter quantum mechanics weirdness. A massless light photon imparts mv momentum to an electron which does have mass and also acts like a mass when it is apparently attracted by gravity. On the "special case momentum transfer triangle," it was totally bogus to assume that m' , with mass, could even travel at the speed of light. By making that assumption, Dr. Einstein was prematurely equating massless photon properties with a mass capable of photon (and thus electromagnetic) properties. We have thus used classical ideas and bogus assumptions to derive:

$$m' = \frac{m_0}{\sqrt{1 - v^2/c^2}}$$

which actually appears to be a quantum mechanical idea. Sort of like proving Santa Claus by noticing empty stockings the night before and full ones on Christmas morning. Perhaps such bogus classical reasoning is perfectly allowable in the weird world of quantum mechanics. Students occasionally do use the wrong methods and make obvious mistakes and still arrive at the correct answer. And how does light manage to travel like a wave at constant speed through empty space? The nature of light and all electromagnetic phenomena seems to be at the very center of quantum mechanics weirdness, and perhaps by clearing up so much misunderstanding about special relativity, greater progress can be made in 21st century physics.

(8) THE FEYNMAN LECTURES ON PHYSICS (the definitive edition), Feynman – Leighton – Sands, Addison Wesley, San Francisco, 2006, Chapters 15, 16, and 17.

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NOT SO FAST, DR. EINSTEIN – PART III

By

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Dr. Louis Victor DeBroglie (1929 Nobel prize in physics) predicted that particles with momentum ($m =$ mass times velocity), such as electrons, should exhibit wavelike characteristics according to:

$$\lambda = \frac{h}{p}$$

Dr. Einstein postulated that all photon "particles" exhibit energy according to Dr. Planck's formula:

$$E = hf = \frac{hc}{\lambda}$$

and that mass can change into energy according to:

$$E = mc^2$$

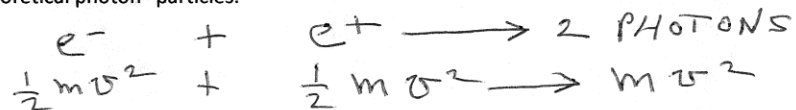
In Part II we saw that we derived:

$$E = mc^2$$

by using a "Special Case Momentum Transfer Triangle" and then neglecting relative velocity v .

SIMPLIFIED MASS - ENERGY TRANSFORMATION MODEL

Taking a non relativistic approach, assume, for example, that an electron "crashes" into a positron (causing mutual annihilation) to form intensive electromagnetic radiation (Gamma rays), depicted below as two theoretical photon "particles."



Assume that the electron and positron each have negligible "spin" energy and thus purely kinetic energy according to:

$$\frac{1}{2} m v^2$$

and as the electron and positron are accelerated together by the Coulomb plus and minus electrostatic forces, each particle approaches the speed of light. When they meet and neutralize each other, they also simultaneously change from mass to pure electromagnetic energy, or photons, with zero mass and also with the speed of light:

$$\frac{1}{2} mc^2 + \frac{1}{2} mc^2 \rightarrow mc^2 = E$$

Dr. Einstein would have predicted $(2)mc$ squared to account for both the mass of the electron and the mass of the positron. So, using:

$$E = mc^2 \quad \text{AND} \quad E = hf = \frac{hc}{\lambda}$$

and momentum $p = mv$ or, at the instant of contact or mutual annihilation:

$$\text{So } E = \frac{hc}{\lambda} = mc^2 = pc \quad \text{with } p = mc$$

$$\text{OR } \frac{hc}{\lambda} = pc \quad \text{OR } \frac{hc}{pc} = \lambda$$

$$\text{So } \lambda = \frac{h}{p} \quad (\text{DR. DEBROGLIE'S FORMULA})$$

So, to get from the

$$E = \frac{1}{2} mv^2$$

and

$$p = mv$$

particle world to the

$$E = \frac{hc}{\lambda}$$

wave world, we did, after all, need:

$$E = mc^2$$

which turns out to be "correct," or half correct, but which has nothing to do whatsoever, really, with relative motion or relativity, as postulated by Dr. Einstein.

So, contrary to electron and positron masses increasing to infinity when approaching the speed of light, as predicted by Dr. Einstein:

$$m' = \frac{m_0}{\sqrt{1 - v^2/c^2}}$$

the masses DECREASE to zero – not even close! Dr. Einstein says infinity and the correct answer is zero!

The question now is how many particles with their corresponding anti particles can be obtained from a mass and what, if anything, is left over?

NOT SO FAST, DR. EINSTEIN – PART IV

By

Glenn A. Baxter, P.E.*

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SPEED OF LIGHT MEASUREMENTS

In his original 1905 Special Relativity paper(4), Dr. Einstein states on page 2:

“.....Light is always propagated in empty space with a definite velocity c (186,000 miles per second) which is independent of motion of the emitting body.....” In other words, this is his postulate that says the speed of light is always constant. Dr. Brian Green, a physicist at Columbia, reports in his book “The Elegant Universe”(10) on page 32 that:

“.....In 1913 the Dutch physicist Willem de Sitter suggested that fast moving binary stars (two stars that orbit one another) could be used to measure the effect of a moving source on the speed of light. Various experiments of this sort over the past eight decades have verified that the speed of light from a moving star is the same as that from a stationary star.....” Indeed, partly in reliance on this reporting by Dr. Green, this writer stated in Part I of this paper that:

“..... A baseball thrown forward by a boy or girl on a flat railroad car travelling, say, ten miles per hour due North, will travel ten miles per hour faster in the due North direction than another baseball thrown with the same intensity in the same direction by a friend standing on the ground by the tracks. The two speeds are additive.

If, instead, the youngsters are pulsing a flashlight beam (at night, of course!) instead of throwing a baseball, the simultaneous light pulses of both flashlights will arrive at a forward overpass at exactly the same time. The speeds are not additive. The pulse from the rail car will be Doppler effect “blue shifted” (higher frequency and thus higher energy) compared with the pulse originating on the ground. The baseball carries its higher energy in its higher speed, and the light carries its higher energy in its higher frequency, consistent with Dr. Planck’s famous relation saying that Energy = (frequency)(Planck’s constant).....”

The above conclusions about the speed of light are not consistent with recent thought experiments conducted by this writer.

SPEED OF LIGHT THOUGHT EXPERIMENTS

Dr. James Clerk Maxwell (1831 – 1879), Scottish Professor of Physics at Cambridge, showed mathematically that electromagnetic waves (presumably including radio waves, light waves, X rays, and

Gamma rays) all travel at the speed of light c or:

$$c = \frac{1}{\sqrt{\mu_0 \epsilon_0}}$$

WHERE μ_0 = PERMEABILITY
CONSTANT

AND ϵ_0 = PERMITTIVITY
CONSTANT

Armand Hippolyte Louis Fizeau (1819 – 1896), the French physicist, actually measured (and thus confirmed) Maxwell's predicted speed of light with a physical cog wheel device which is illustrated by Dr. George Gamov in his book "One Two Three Infinity" (9):

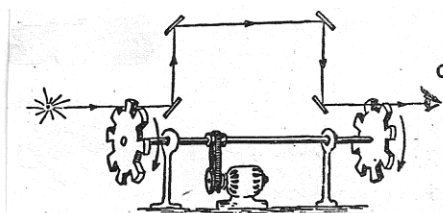


Figure 1

Quoting Dr. Gamov on Page 81: "...Two cogwheels set on a common axis in such a way that if you look at the wheels parallel to the axis you can see the cogs of the first wheel covering the intervals between the cogs of the second one. Thus a thin beam of light sent parallel to the axis cannot pass through, no matter how the axis is turned. Suppose now that the system of these two cogwheels is set into rapid rotation. Since the light passing between two cogs of the first wheel must take some time before it reaches the second wheel, it will be able to pass through if during that time the cogwheel system turned by half the distance between two cogs. The situation here is rather similar to that of a car moving at a proper speed along an avenue with a synchronized system of stop lights. If the wheels are rotating twice as fast, the second cog will come into place by the time the light gets there, and its progress will be again stopped. But at a still higher rotation speed the light will be able to go through again since the cog will have passed the path of the light, and the following opening will be within the path of light just at the proper time to let the light through. Thus, noticing the rotation speeds corresponding to successive appearances and disappearances of light one is able to estimate the speed of light while traveling between the two wheels. To help the experiment, and to reduce the necessary speed of rotation, one can force the light to cover a larger distance while going from the first cogwheel to the second; this can be done with mirrors as indicated (in the figure). In this experiment Fizeau found that he was first able to see light through openings in the wheel nearest him when the apparatus was rotating at 1000 revolutions per second.

This proved that at that speed cogs had traveled half the distance between them in the length of time necessary for the light to travel the distance from one wheel to the other. Since each wheel had 50 cogs all of identical size, this distance was obviously $1/100$ the circumference of the wheel, and the time of travel the same fraction of the time it took the wheel to make a complete revolution. Relating these calculations to the distance through which light passed from one wheel to the other, Fizeau arrived at a speed of light of 186,000 miles per second, which was about the same as the result as obtained by

Roemer in his observations of the satellites of Jupiter....." and the speed of electromagnetic waves as calculated by Maxwell.

The Fizeau apparatus, together with the moving rail cars already discussed in this paper, can be used in several "thought experiments" to test the correctness or errors in Dr. Einstein's hypothesis that the speed of light is really constant.

First, consider being in a space ship in the middle of space with nothing else existing in the universe whatsoever. Is your spaceship moving or is it stationary? You check the space ship's log and find no record of acceleration, so you conclude that you are stationary. Now, you IMAGINE an imaginary point 12 billion light years away apparently moving directly toward you at a speed of 100,000 miles per second. Are you moving toward the point or is the point moving toward you? How can you tell which is which? You cannot.

Now imagine that the point is instead a flashlight pointed directly at you. If the flashlight is stationary, the light is coming at you at the speed of 186,000 miles per second while you are moving toward the light beam so as to meet the light beam part way (near the middle) in 12 billion years minus $(100/186) \times 12 = 12 \text{ minus } 6.45 = 5.55 \text{ billion years.}$

So, you can say that the speed of light is a constant 186,000 miles per second and you are meeting it about half way, or, in the alternative, you can say that the light is travelling faster, at the rate of 286,000 miles per second. It is impossible to tell which is which. Let's continue these "thought experiments":

Let's imagine your space ship is really a "space car" 12 billion light years long. Regardless of whether you imagine an external point that is stationary or moving relative to your space craft, a light flash from the back of the "space car" will take 12 billion years to reach the front of the "space car."

Now imagine the external point is a distance ahead of the "space car" and moving toward the car or else the car is moving toward the point at the velocity v such that the point and the front of the car meet at the exact instant that the flash from the back of the "space car" gets to the front of the "space car."

Again, either the light travels at 186,000 miles per second to the front of the car while the front of the car reaches the point or the same thing happens while the point reaches the car. It is impossible to tell which is which. In one case the light is traveling at 186,000 miles per second and in the other case we measure the light as traveling faster. It is still impossible to tell which is which.

Now we try using the Fizeau apparatus mounted on a rail car:

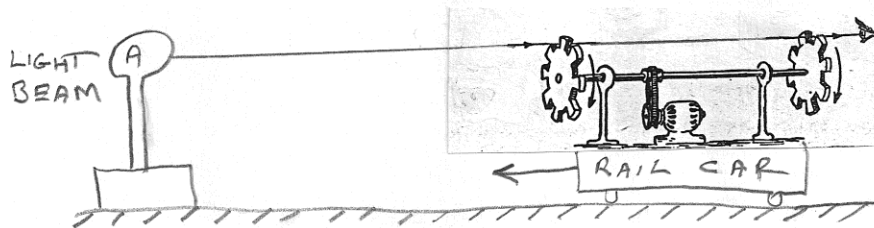


Figure 2

Light is flashed from the "fixed" point A from left to right while the rail car approaches the light beam from right to left. The Fizeau apparatus will clearly measure the light travelling between the cog wheels as being faster than 186,000 miles per second as the rail car is meeting the light flash part way. The light can be said to be travelling at 186,000 miles per second with the Fizeau apparatus simply measuring a higher speed.

Now let's assume the car to be "fixed" and the source of the light to be moving from left to right:

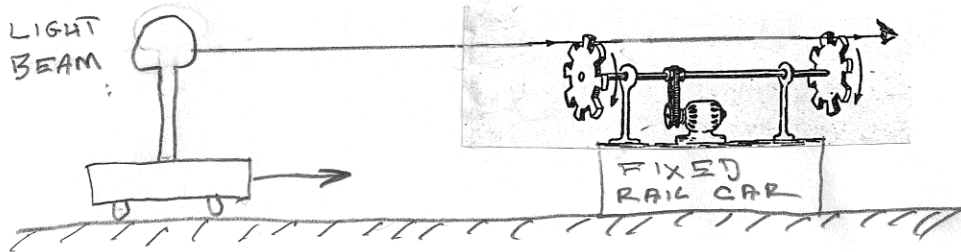


Figure 3

Figure 2 is really equivalent to Figure 3, but in Figure 3 it can be said that light is travelling faster than 186,000 miles per second on the one hand and on the other hand light is travelling 186,000 miles per second in figure 2 and the car is meeting the light beam part way. It is impossible to tell which is which.

Next is the issue of a light on a moving rail car moving forward racing against a light flashed from the ground toward a forward overpass. You can consider this or consider the equivalent situation of the rail car being stationary with the overpass moving toward the car while the person previously on the ground is also moving such that there remains no relative motion between that person and the overpass. Both light flashes in this thought experiment will not arrive at the overpass at exactly the same instant as previously stated in Part I of this paper. The speed of light in this "thought experiment" turns out NOT to be constant.

Finally is the issue if binary stars sending light toward us far away. One star is moving toward us and the other star at exactly the same distance is moving away from us:

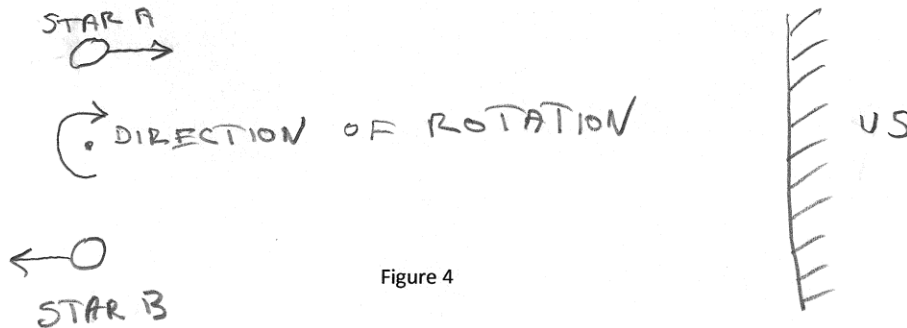


Figure 4

NOT SO FAST, DR. EINSTEIN – PART V

By

Glenn A. Baxter, P.E.*

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(See also the February 1963 Scientific American article “The Clock Paradox” by J. Bronowski)

SPEED OF LIGHT THOUGHT EXPERIMENTS WITH BINARY STARS

Dr. Einstein states in his 1916 book, The Special Theory of Relativity, that Dutch astronomer De Sitter was able to show that light from two (binary) stars circling each other, one while one is towards us and the other is heading away from us, would arrive at exactly the same instant.

Consider Figure 1-a where points A and C represent a double star system and the stars are rotating around “fixed” point B in a clockwise direction. Points D and F represent another double star system which rotate in a clockwise direction around “fixed” point E. Does light from A and C actually arrive at the vertical line through point E at exactly the same time? At the instant shown in Figure 1, the light source at C is moving toward the vertical line through E and the light source at point A is moving away. For the moment, let’s consider a simplified version of this thought experiment in Figure 2 with all four stars moving tangent to their circular orbits in straight lines and the stars thus not rotating at the instant that the light from the sources A and C are “flashed.”

Now consider Figure 2-a where a light is “flashed” from point C toward point D. Points B, G, and E are considered to be “fixed” as indicated on the diagram. Light source C is moving from left to right with velocity v . Relative to “us” at point G, does the light move “faster” than the speed of light c ? Does it move at speed $c + v$? Since all uniform motion is relative to other uniform motion, we can instead consider points C and D to be “fixed” and points B, E, and G to be moving from right to left at speed v . Thus, a vertical line through E will meet light from C “part way” at point H at time $= t(1)$. In this case, the speed of light appears to not have changed at all but to still be c . However, the RELATIVE VELOCITY between the light from source C and the vertical line through E appears to have increased to $c + v$.

If, however, we go back to considering B, G, and E to be “fixed,” then to “us” at point G, the SPEED OF LIGHT appears to have increased to $c + v$. When arriving at the vertical line through E, the light will be Doppler “blue shifted,” or with more energy (at a higher frequency in accordance with Planck’s $E = hf$, where h is Planck’s constant and f is frequency). The increased speed of light allows the flash to arrive sooner, at $T(1)$ than a flash from “fixed” point B would arrive at “fixed” E at $T(2)$.

Also, point D appears to be “running away,” from the light flash from point C, at speed v , and the light finally “catches up” to D at point I at time $= T(2)$. There is no relative motion between points C and D, and the light arriving at D is not Doppler shifted at all.

The light, due to motion v of point C, was thus given some "extra energy," which was both represented by the Doppler blue shift (or increase in frequency) and extra speed v . The extra speed gets the light to point H "sooner," at $T(1)$

If point D were instead "fixed," until the light arrived at time = $T(1)$, and then suddenly "jumped up" to speed v , the light due to the extra v would arrive "sooner" at D, or at time = $T(1)$, but the "extra" relative energy (or blue shift) would now be gone because of D's speed which was suddenly increased by v .

Think of a car moving at 20 miles per hour headed due east. A second car is sitting still on the same road 20 miles due east of the first car. In one hour there will be a huge "crash" when car 1 collides with car 2. If, just before the "crash," car 2 accelerates up to 20 miles per hour due east, there will be no "crash" because there will be no velocity difference, exactly analogous to the situation with the light flash above.

Now consider light flashed from point A (which is moving from right to left at speed v) toward point F, (also moving from right to left at speed v). Is the light, relative to "us" at point G going slower? Again, we can consider A to be "fixed" and the vertical line through point E to be "running away" from the light flash. Here the light speed appears to be unchanged but THE RELATIVE VELOCITY between point A and the vertical line through point E seems to be increased by v . However, if we consider points B, G, and E to be "fixed," then the speed of light appears to be decreased to $c - v$.

Going back to Figure 1, where the stars are rotating, there would be a problem with our above analysis where we considered C and A to be "fixed" and the vertical line through E to be moving, since relative to C the vertical line through would have to move to the left but relative to A it would simultaneously have to move to the right as indicated in Figures 1-b and 1-c. This is, of course, impossible.

Thus we cannot consider the speed light to be constant with other things either catching up with it or running away from it to change the relative velocity. Instead, we must consider the relative speed of light compared to some common point to be actually speeding up or slowing down. Light relative to its source in uniform motion, however, is constant.

NOT SO FAST, DR. EINSTEIN - PART VI

By

Glenn A. Baxter, P.E.

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GENERAL RELATIVITY

Dr. Einstein's Special Theory of Relativity has been disproved, mathematically, in Parts I - IV of this paper. The findings therein show that relative uniform motion DOES NOT cause time to slow down, mass to increase, or measuring rods to change length. Also, the speed of light, correctly predicted mathematically in 1873 by James Clerk Maxwell, IS NOT measured the same by all observers who are in relative motion. Dr. Einstein's erroneous analysis happens, by error, to put forward, for wrong reasons, in 1905 (See Analen der Physik, 17, 1905, Page 32, "A Stubbornly Persistent Illusion" edited by Dr. Stephen Hawking, Running Press, Philadelphia - London) , the correct the idea that:

$$E = mc^2$$

This formula, which just happens to be right, has been taken, to date, as "gospel" by most scientists today. It provides a vital bridge between classical mechanics and later developed quantum mechanics ideas which center on the very interesting and strange behavior of electromagnetic photons (energy particles/packets of energy) that also act like radiation waves.

Electrons, positrons, protons, and neutrons, all have mass and all obey Newton's mass and gravity relationships:

$$F = ma = K \frac{m_1 m_2}{r^2} \stackrel{v}{=} mg$$

Photons do not have the mass needed to be used in the above formulas, but yet they do exhibit momentum ($P = \text{mass times velocity}$), as demonstrated by Arthur Compton (Nobel Prize in Physics 1927), and are affected by gravity, as observed in 1919 by the deflection of starlight moving past the surface of the sun, visible only during a total eclipse. According to Newton's relationship:

$$F = \frac{K h_1 m_2}{r^2}$$

this would not seem possible if you consider $M(2)$ to be the mass of the sun and $M(1)$ to be the mass of a photon (which is zero). In other words, how can gravity affect a photon, without mass, when Newton's formula:

$$F = \frac{K m_1 m_2}{r^2}$$

suggests that gravity can only affect entities that do have mass? This is why we need to use the important bridge between the mass and energy worlds:

$$E = mc^2$$

Dr. Einstein tried to calculate the effect of gravity on light photons in 1911 (See *Analen der Physik*, 35, 1911, Page 35, "A Stubbornly Persistent Illusion" edited by Dr. Stephen Hawking, Running Press, Philadelphia - London) by first postulating that gravity is identical to acceleration and then applying his incorrect theory of Special Relativity and the correct relationship:

$$E = mc^2$$

His ideas therein translate to figure 1 below where if you were in a box, you could not tell whether the box was sitting on the surface of the earth in its gravitational field or in the middle of deep space with a rocket motor underneath the box accelerating the box upward at the same rate that an apple on the earth surface would accelerate downward due to gravity. This equivalence is not exactly true because gravity at the bottom of the box on the earth's surface would be stronger than gravity at the top of the box in accordance with Newton's relationship:

$$F = \frac{K m_1 m_2}{r^2}$$

With the rocket motor under you in deep space, the accelerations down of something dropped inside the box would be the same at the top of the box as it would be at the bottom of the box. Consider figure 1:

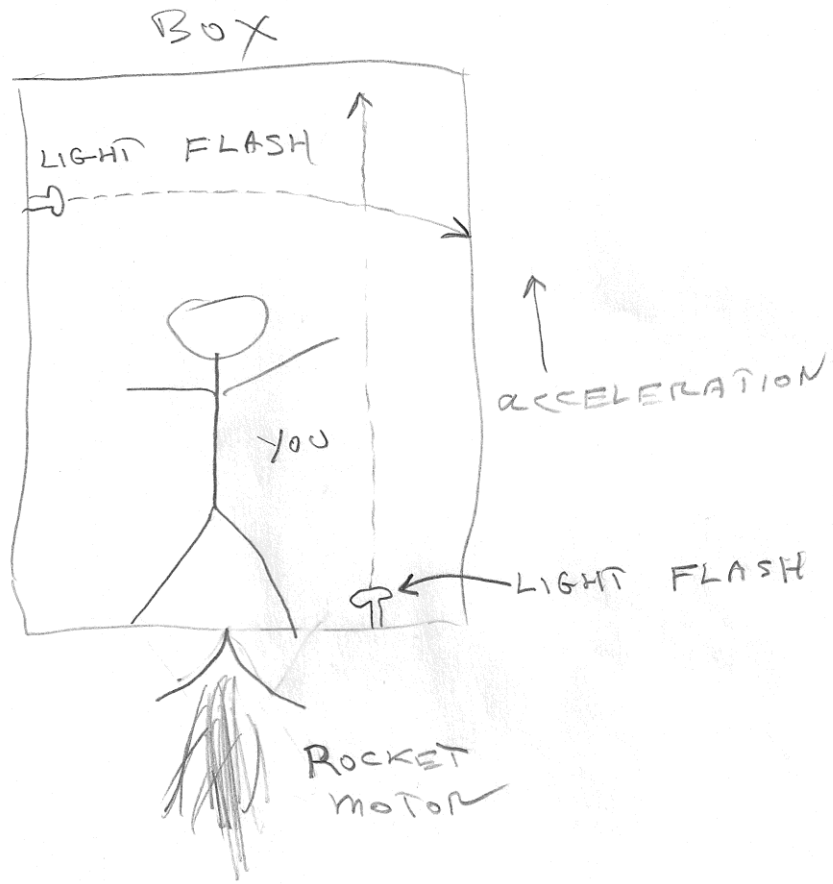


Figure 1

A light photon flashed from left to right across the box will curve downward because the box is accelerating upward while the photon is not imparted with any further" pushing." We know from the 1919 star deflection measurements that the light flash would do the same thing if the box were sitting on the surface of the earth as gravity appears to "pull" on the photon. In the first box experiencing acceleration, the photon would seem to curve the same while going from left to right where in the box on the earth surface, the pull of gravity would be greater as the photon gets closer to the earth. Thus the effects in the two boxes are not exactly identical as postulated by Dr. Einstein.

If you flash a photon upward in the box in deep space with the rocket motor, the top of the box will "pull away" from the photon as compared with a box in deep space with the rocket motor turned off. There will be a similar but not exactly the same effect on the upward moving photon in the box sitting on the earth's surface. Again, the "pull" on the photon in the box sitting on the surface of the earth will be less at the top of the box than at the bottom, where the effect as the photon in the box in deep space with the rocket motor operating would be the same at both the bottom of the box and the top of the box.

Thus, using an incorrect postulate (the EXACT equivalence of gravity and acceleration) , incorrect Special Relativity analysis, and:

$$E = mc^2$$

Dr. Einstein calculated the deflection of a photon flying close to the surface of the sun as creating an angle of .83 seconds of a degree. This just happens to be close to the 1919 solar eclipse observations, which gives the false impression that Dr. Einstein's wide ranging Special and General Relativity theories are 100% correct.

Dr. Einstein's 1911 paper also calculates that a clock in a gravitational field will slow down as compared with a clock not in a gravitational field. Going back to figure 1, the box will pull away due to acceleration from a light flash from the bottom of the box, thus exhibiting a red shift (lower frequency) when observing that photon at the top of the box. Dr. Einstein calculated, in his 1911 General Relativity paper, a red shift (or frequency change) of a photon in a gravitational field to be:

$$\frac{f_0 - f}{f_0} = - \frac{\Phi}{c^2} = \frac{KM}{cr^2}$$

(See also Page 231, "A Stubbornly Persistent Illusion" edited by Dr. Stephen Hawking, Running Press, Philadelphia - London)

The gravitational field does, indeed, cause a red shift to the photon in a gravitational field quite similar to the red shift (Doppler) caused by acceleration, but the calculations need to be done correctly and without using mostly incorrect Special and General Relativity theory.

Finally, Dr. Einstein postulated in 1911 that since gravity does not seem have any way to "pull" on a massless photon, then, instead, the presence of any mass must somehow distort or "bend" or "curve" empty space and that a photon simply follows a straight line through this curved space similar to what you would do if you drove west in a straight line on the surface of the curved earth. In that case, of course, you would actually be travelling in a curve as you trek around the globe. Thus Dr. Einstein postulated a very different and exotic fabric of "space time" when he included Special Relativity time slowing, due to relative motion, as he postulated it ticking away at different rates.

This view of gravity as mass distorting empty space seemed to better explain the movements of Mercury, the planet nearest to our massive sun, by using his calculated formula:

The angle described by the radius sun-planet between one perihelion and the next should exceed that corresponding to one complete revolution by an amount given by:

$$\frac{24\pi^3 a^2}{T^2 c^2 (1-e^2)}$$

(See Page 227, "A Stubbornly Persistent Illusion" edited by Dr. Stephen Hawking, Running Press, Philadelphia - London) The first problem with this particular General Relativity formula is that the units on the left side of the equation do not match the units on the right side of the equation.

This equation is a bit far fetched since the sun is far from being a homogeneous mass, but is instead a huge animal with all kinds of internal rotating metal liquids, magnetic fields, and electric currents, so Mercury's slight deviation from Newton's:

$$F = \frac{K m_1 m_2}{r^2}$$

could also be explained in a number of other ways that we can never really know about since we cannot dissect the sun very well from here on earth. Again, Dr. Einstein's slightly closer description of Mercury's motion gives the false impression that his Special and General theories of Relativity are 100% correct.

That was in 1911. In 1921, Dr. Einstein got a very well deserved Nobel Prize in Physics, not for the crazy "space time" model and other ideas put forward in Special and General Relativity, but rather for his 1905 paper (See *Analen der Physik*, 17, 1917, or Page 307, "A Stubbornly Persistent Illusion" edited

by Dr. Stephen Hawking, Running Press, Philadelphia – London) about the photo electric effect and his other later and quite significant contributions to quantum physics which we can now use to explain what is really going on with photons of light and gravity.

2010 ANALYSIS – 99 YEARS LATER WITH 20 - 20 HIND SIGHT

Take Newton's relationship for gravity and consider $M(1)$ to be the zero mass of a photon.

$$F = \frac{K m_1 m_2}{r^2}$$

To keep anything, including a massless photon in a circular "orbit," there must be an acceleration toward the circle's center of:

$$a = \frac{v^2}{r}$$

But for a photon, $v = c$ and since:

$$E = mc^2, m_1 = \frac{E}{c^2} \text{ So,}$$

$$F = \frac{K m_1 m_2}{r^2} = K \frac{E}{c^2} \frac{m_2}{r^2} = m a = \frac{E}{c^2} \frac{c^2}{r}$$

or,

$$\frac{K m_2}{r^2} = \frac{c^2}{r} \text{ OR } m_2 = \frac{c^2}{r} \frac{r^2}{K} = \frac{c^2 r}{K}$$

Thus $M(2)$ is the "test" mass necessary to keep a photon in circular "orbit." Since:

$$\frac{c^2}{r}$$

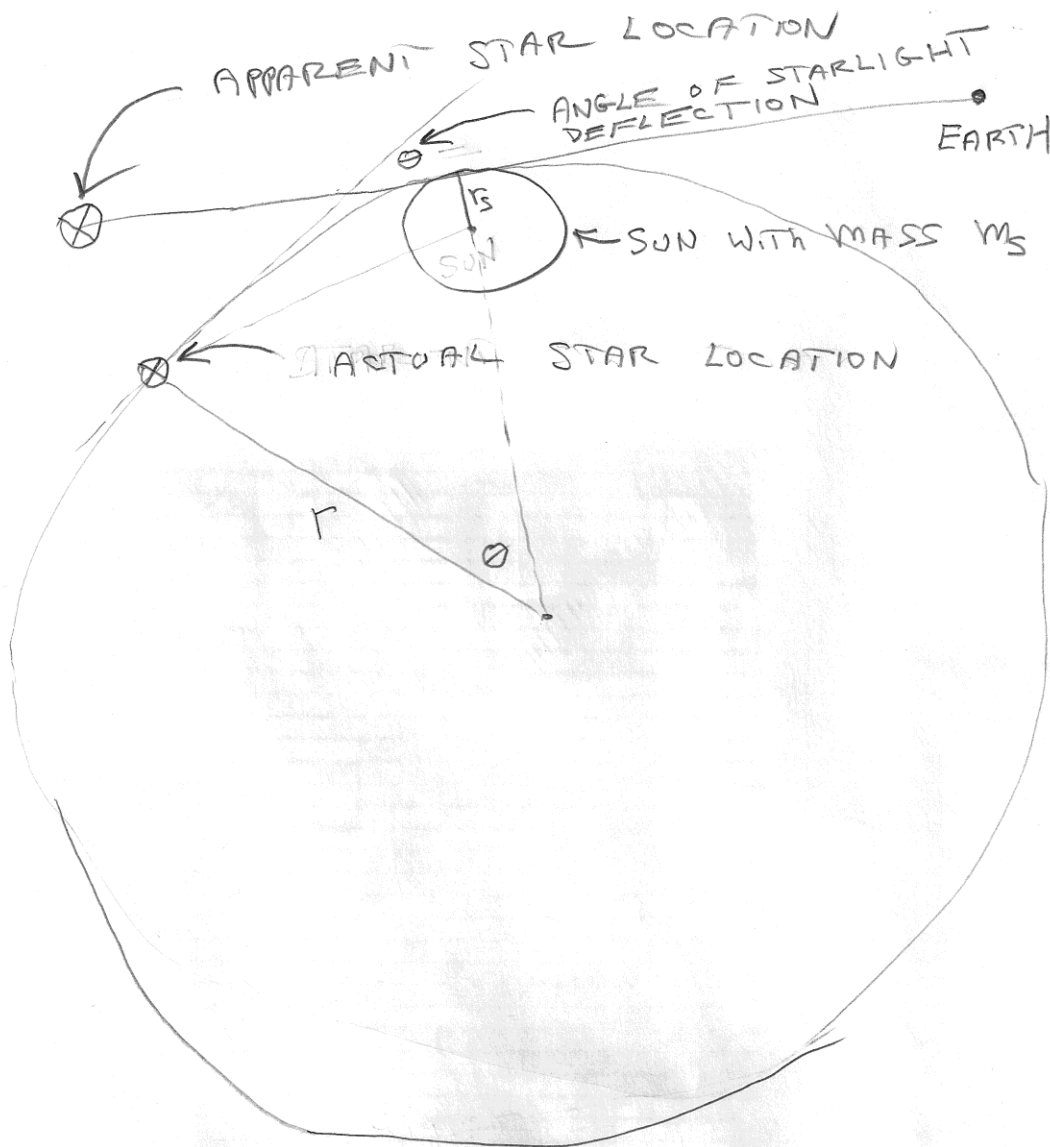
is the is the acceleration caused by "test mass" $M(2)$ on a photon in circular "orbit,"

$$\frac{c^2}{r} \quad \frac{m_1}{m_2}$$

is the proportionally less actual acceleration on a photon caused by the sun so that:

$$\frac{m_1}{m_2} = \frac{r_s}{r} \quad \text{OR} \quad r = r_s \frac{m_2}{m_1}$$

Thus a photon from the distant star will follow a circular orbit with radius r caused by interaction with gravity from the sun. Dr. Einstein offered in 1911 to explain this photon movement in terms which said that the sun somehow "curved space" as shown by this same circle with radius r in figure 2 and that the photon simply followed a straight line in this curved space similar to you following a straight line driving due east on the surface of the earth which is, in fact, a globe. This does not appear to be a good model of what is really happening and is, in fact, quite misleading. These myths, so created by Dr. Einstein, of time flowing at different rates and space curving, all caused by uniform relative motion, accelerated motion, and the presence of mass, in his Special and General theories of relativity, are apparently mathematically invalid.



IN SUMMARY, FIGURE 2.

$$M_2 = \frac{c^2 r}{R} \quad \text{and} \quad r = r_s \frac{m_2}{m_s}$$

The calculations for angle of deflection θ are carried out in Appendix 1

NOT SO FAST, DR. EINSTEIN – PART VII

By

Glenn A. Baxter, P.E.*

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(See also the February 1963 Scientific American article “The Clock Paradox” by J. Bronowski)

CONSERVATION OF ENERGY AND RELATIVE ENERGY

Imagine a perfectly smooth earth with nothing on the surface except a car on the equator traveling due west at a speed of 10 miles per hour. We now add energy to the car by raising the speed to 70 miles per hour. One way of retrieving the extra kinetic energy added to the car would be to step on the brakes, slowing back to 10 miles per hour and changing the added energy to heat in the brake drums.

We now add a second car leading the first car, also going 10 miles per hour. There is no relative energy between the two cars; one cannot crash into the other and thus release “stored up” kinetic energy.

Again, we add energy to the lagging car by raising the speed to 70 miles per hour. Now, there will be a huge “rear ender” as the two cars crash with a relative speed of 70 minus 10 = 60 miles per hour.

Now imagine a railroad flat car heading toward an overpass at a speed of 60 miles per hour. Someone on the flat car flashes a light toward the overpass. At the same time, someone standing on the ground also flashes a light toward the overpass. Because of conservation of energy, a photon from the flat car must have greater energy than a photon flashed by the other person standing on the ground. But the photons have no mass. We do know that a person on the overpass will notice a Doppler blue shift for photons from the flat car. Since energy of the photons are $E = hf$, or Planck’s constant times frequency, the increased energy of a photon from the flat car will be accounted for by the blue shift or higher frequency as measured on the overpass and caused by the relative speed v , 60 miles per hour, of the rail car:

$$E = hf + h(v/\lambda)$$

where the relative velocity of the flat car causes an addition to photon frequency of:

$$\Delta(f) = (v/\lambda)$$

where λ equals wave length.

We see, therefore, that the conservation of energy actually mandates that the relative velocity of photons from the flat car are greater than c , the speed of light by the amount of relative velocity of the flat car which is v or 60 miles per hour.

NOT SO FAST, DR. EINSTEIN – PART VIII

By

Glenn A. Baxter, P.E.*

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(To see the entire paper, Parts I through VII, go to www.k1man.com/b
www.k1man.com/c)

Part VIII starts at

EXPERIMENTAL DISPROOF OF SPECIAL RELATIVITY -

RELATIVISTIC DOPPLER EFFECT CORRECTED

If a light source is moving towards an observer in uniform motion, the standard physics textbook formula for the Doppler shift (see The Feynman Lectures On Physics, Vol., 1 Chapter 34, Page 7) is:

$$W = W_o (\sqrt{1 - v^2/c^2}) / (1 - v/c) \quad \text{eq. (1)}$$

The correct (Baxter Relativity) formula (11) for this situation is:

$$W = W_o(1 + v/c) / (1 - v/c) \quad \text{eq. (2)}$$

Thus, when $\frac{v}{c} = 0.1$,

the incorrect conversion factor from Dr. Feynman's relativistic Doppler formula is a frequency blue shift of 1.105541597 rather than the correct Baxter relativistic formula giving a blue shift factor of 1.222222222. Not a big difference here, but Dr. Feynman was sucked in (like everyone else) to relative light speed being constant and thus leading to Dr. Einstein's completely falsely based theory of Relativity. The ramifications of this are huge, since Dr. Einstein's relativity theories are laced throughout most of current physics thinking.

EXPERIMENTAL DISPROOF OF SPECIAL RELATIVITY:

Eq. (1) above represents Dr. Einstein's formula for the Doppler shift, including his relativistic time dilation, between an electromagnetic source (a light source or a radio transmitter) and an observer (or a radio receiver). $(\sqrt{1 - v^2/c^2})$ represents the Einstein relativistic time dilation portion and $(1 - v/c)$

represents the classic Doppler shift portion. Eq. (2) above represents the corrected Baxter relativistic Doppler formula which replaces the Einstein time dilation portion with $1 + v/c$ which represents, instead, the increased relative velocity of light rather than a slowing of time “caused” by relative motion.

In this experiment we use two earth satellites travelling in opposite directions. One satellite has a 30 MHz. transmitter and the other has a receiver. A typical amateur radio transceiver can transmit and receive to an accuracy of 10 cycles per second compared to the 30,000,000 cycles per second of this experiment. We use earth satellites to eliminate any effect that atmosphere or gravity might have on the speed of light.

Both satellites travel at a speed, for example, of 25,000 miles per hour. Plugging 50,000 miles per hour into Dr. Einstein’s Eq. (1) above yields a “blue shift” frequency of 30,002,240.24 cycles per second. Plugging 50,000 miles per hour into Eq. (2) above yields a “blue shift” frequency of 30,004,480.62 cycles per second, a full 2,240.38 cycles per second higher, a huge difference, which is easily measureable on any amateur radio high frequency transceiver. Thus we have a very simple and quite elegant disproof of Dr. Einstein’s Special Theory of Relativity.

(11) $W = W_o / (1 - \frac{v}{c})$ is the classic Doppler “blue” shift (see The Feynman Lectures On Physics, Vol., 1 Chapter 34, Page 7). Rather than Dr. Einstein’s time dilation factor, we, instead use the Baxter speed of light change factor of $\frac{c+v}{c}$ so the total formula becomes $W = \frac{W_o}{1-v/c} + W_o (c + v)/c$ which leads directly to $W = W_o (1 + \frac{v}{c}) / (1 - \frac{v}{c})$ QED It is quite interesting that the Einstein $(\sqrt{1 - v^2/c^2})$ factor causes a slight red shift in opposition to the classic $(1 - \frac{v}{c})$ Doppler blue shift in this situation as the source is moving towards the observer, these opposite effects themselves, being counter intuitive.

NOT SO FAST, DR. EINSTEIN – PART IX

(Revision 100831A)

By

Glenn A. Baxter, P.E.*

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(To see the entire paper, Parts I through VII, go to www.k1man.com/b
www.k1man.com/c)

Part VIII starts at

A CLEAR EXPLANATION OF THE BAXTER RELATIVISTIC DOPPLER EFFECT

Imagine a light or radio source at point A in deep space and an observer or receiver some distance away at point B. There is a relative velocity between the two, say 50,000 miles per hour, as discussed in Part VIII. We choose deep space to allow us to neglect all other outside influences. We can consider B as still or fixed with A moving towards B, or we can consider A as still or fixed with B moving toward A. We postulate that these two situations are equivalent.

Further, consider a 30 MHz. radio signal being radiated from A which is moving toward B (at the relative speed of 50,000 miles per hour). The signal is a simple continuous radio wave (CW, still used by radio amateurs using Morse code for communications purposes). Consider the peak voltage of a single cycle emitted as an instantaneous pulse being emitted from point A at time T_0 . When the very next instantaneous pulse during the next cycle is emitted, point A is a bit closer to point B, and since the speed of light is finite, there is less distance to travel, and therefore, will arrive in less time than the previous pulse sent just before time T_0 . The effect is the classic Doppler effect at the receiving end (B) where the pulses are closer together in both space and time and the frequency reading on the radio receiver at point B is higher than 30 MHz., according to the classic formula $W = \frac{W_0}{1-v/c}$. Now, instead of saying that time at point A “slows down” according to Dr. Einstein’s $W = W_0 (\sqrt{1 - v^2/c^2})$, “caused” by relative motion, let us consider point A as being still, or fixed, and point B moving toward point A. Since the speed of light is finite, point B will meet the pulse from point A emitted at time T_0 part way. Right? The relative speed of light is therefore c plus 50,000 miles per hour. Right? This is not rocket science, to use a play on words. You can still say the speed of light has not changed; nobody bothered the light in this situation at all. But B has met the radio pulse part way, and so the relative speed of light between A and B is greater than the speed of light. This is at the heart of Baxter Relativity as opposed to Dr. Einstein’s relativity which insists that the relative speed between points A and B remain the same, and that, instead, time at point A must therefore “slows down.”

Thus we reject Dr. Einstein’s erroneous postulate of the speed of light always being constant for any observer, and we modify the relativistic Doppler formula from $W = W_0 (\sqrt{1 - v^2/c^2}) / (1 - v/c)$ to $W = W_0(1 + v/c) / (1 - v/c)$. See this entire paper at www.k1man.com/b

So, the correct Baxter Relativistic Doppler formula has two things causing the frequency reading at point B to rise, the first is that the distance travelled by the radio or light signal is getting progressively smaller, and second, point B is “catching up” with the signal emitted from point A (or meeting it part way), effectively equivalent to the speed of light being higher rather than Dr. Einstein’s slowing down of time.

Now go back and read this entire paper again. www.k1man.com/b and www.k1man.com/c From his erroneous postulate of the speed of light being constant for all observers, Dr. Einstein builds his entire theory of relativity. Dr. Einstein’s theory of relativity is laced throughout modern physics thinking and this needs to be corrected before we can make further meaningful progress.

PRACTICAL BAXTER RELATIVISTIC DOPPLER EXPERIMENTAL PROOF

The index of refraction is defined as the ratio of the speed of light in a vacuum to its speed in another medium such as air. The index of refraction of air at one atmosphere is 1.0002926. Thus the speed of light that we have rounded in Part VIII of this paper to 186,000 miles per second for $\frac{v}{c}$ calculation purposes, would be reduced from 186,000 to $186,000/1.0002926$ miles per second. Now we calculate the Baxter Relativistic Doppler effect for two ordinary aircraft approaching each other, each with an air speed of 250 miles per hour. Plugging this relative air speed of 500 miles per hour into $W = W_0(1 + v/c)/(1 - v/c)$ now changes a 30 MHz. radio signal transmitted from one of the aircraft and received by the other to 30,000,042.9 cycles per second, still easily measured by any modern amateur radio transceiver. The radio frequency dial would actually read 30.000.04.

NOT SO FAST, DR. EINSTEIN – PART X

By

Glenn A. Baxter, P.E.*

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(To see the entire paper, Parts I through VII, go to www.k1man.com/b Part VIII starts at www.k1man.com/c)

TERMINAL VELOCITY OF LIGHT IN AIR

In Part VIII, we postulated that in deep space, light from a source at point A moving toward a “fixed” point B was equivalent to the light source A being “fixed” with point B moving toward point A. In the latter situation, we saw that point B moving toward point A would meet the light pulse “part way” and this the relative speed of light between the two points was greater than the speed of light, all this happening in the vacuum of deep space.

In air, things will be different. Light is slowed down by any transparent medium in the amount equal to $1/(\text{index of refraction})$, as pointed out in Part IX of this paper. Light is “trying,” but it just can’t go the full speed of light (of a vacuum) as it is somehow slowed down by the medium. Now somewhat analogous to sound, the medium sets a terminal velocity for the light, and NOW the velocity of the source relative to the medium (in this case air) will not increase the relative velocity since the situation

here is clearly different than the source at point A being fixed relative to the air with point B doing the moving relative to the air. Now, the experiment in Part IX must be looked at differently.

The two aircraft in Part IX now have separate influences if point A is the source since light from aircraft A will reach the speed of light in air and NOT the speed of light in air plus the speed of the aircraft relative to the air. Aircraft B, however, will still meet the light pulse “part way” as before. The Baxter Relativistic Doppler formula for this situation now becomes:

$$W = W_o \left(\frac{1}{1 - \frac{v}{c}} \right) - W_o + W_o \left(1 + \frac{v}{c} \right) / \left(1 - \frac{v}{c} \right) \quad \text{eq. (3)}$$

With the first term calculating the classic Doppler caused by the source aircraft A going 250 miles per hour relative to the air plus the full Baxter Relativistic Doppler effect of the receiving aircraft B which is still meeting the light pulse from aircraft A “part way.” Now plugging 250 miles per hour into each of the terms of eq. (3) yields a receiving frequency of 30,000,033.63 MHz., still easily readable on a modern amateur radio transceiver. The radio dial would read 30.000.03.

BINARY STARS

Dr. Einstein said in his 1916 book, The Special Theory of Relativity, chapter 7, that “...By means of similar considerations based on observations of double stars, the Dutch astronomer De Sitter was able to show that the velocity of propagation of light cannot depend on the motion of the body emitting the light....”

Dr. Einstein’s broad generalization from this was wrong. The relative velocity of light in the vacuum of space IS affected by relative motion of the emitter. In earth’s atmosphere, however, light velocity at its terminal velocity in air is not affected by the relative velocity of the emitter, thus leading Dr. De Sitter and Dr. Einstein’s wrong conclusions and upon which Dr. based all of his theories of relativity.

In fairness, Dr. Einstein simply did not have the data, technology, or time to “fool around” any further. He made some bold postulates so things could move forward as they certainly did. But now we must recognize his errors, fix them, and then move forward again. Dr. Einstein made monumental contributions to physics in many ways other than relativity theory. His well deserved 1921 Nobel prize was for the photoelectric effect, not his constant speed of light based theories of relativity.

Dr. Richard Feynman agrees with me (in his famous 1961 - 1963 Cal Tech student lectures, Volume I, Chapter 1, Page 2, he says: “.....The energy which is liberated is the energy of the atomic bomb. This energy is usually called ‘nuclear’ energy, but it is really ‘electrical’ energy released when electrical forces have overcome the attractive nuclear forces.....”) about the source of energy from an atomic bomb coming from electrostatic energy stored and not $E = MC^2$. Yes, many photons are created during an atomic explosion by electron – positron annihilation according to $E = MC^2$, but the actual source of energy is positive chunks of split atoms flying apart due to Coulomb electrostatic forces and not a simple

and direct $E = MC^2$ conversion. Plus there is God knows what else is going on there, but not as simple as $E = MC^2$ as everyone assumed in 1945 in light of the Hiroshima explosion. Dr. Einstein's incorrectly relativity based development of $E = MC^2$ just happened to be correct, but this is only a special case of electron – positron annihilation and not a general case for all matter of a simple $E = MC^2$ mass – energy conversion.

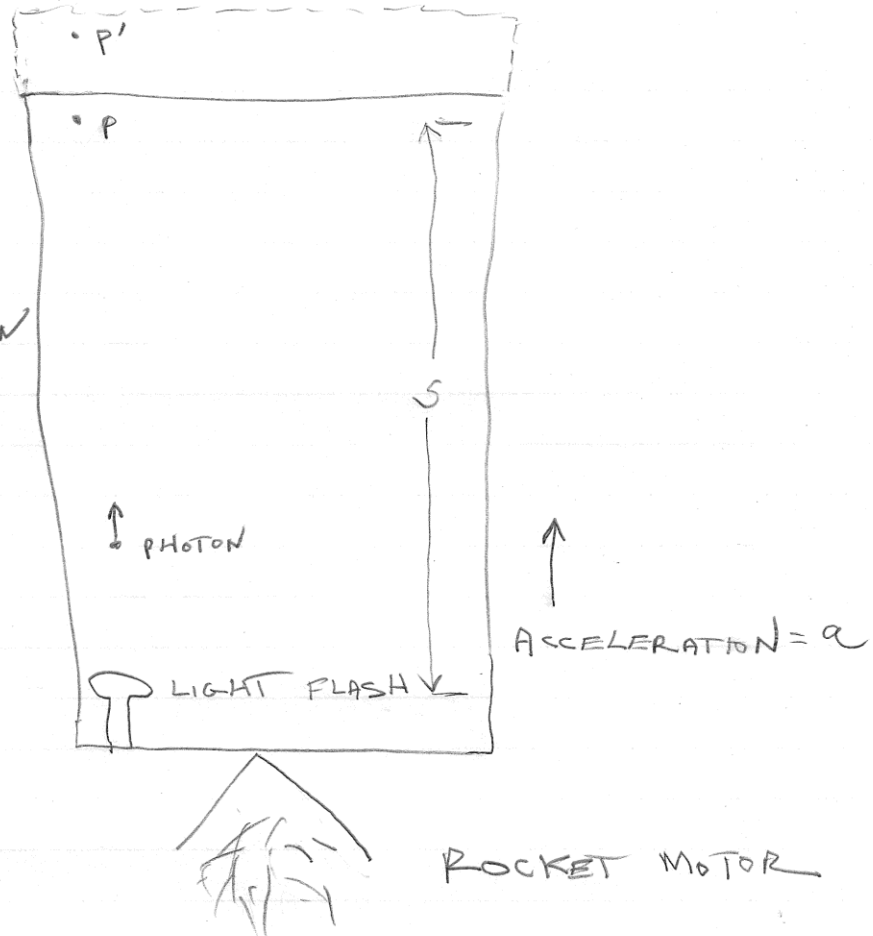
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PART XI

Not So Fast,

Dr. Einstein

CLOCKS IN
ACCELERATION
OR IN A
GRAVITY FIE



During uniform motion of the rocket, a photon

goes $c = \frac{S}{T}$ $a = \frac{S T_1}{S \text{ec}^2}$ $v = v_0 + aT$ but

inside the spacecraft, $v_0 = 0 \therefore$ The

equivalent speed of light inside the spacecraft

is $c - v = c - aT \therefore$ The photon arriving at

P is red "Doppler shifted" $w = w_0 \left(1 - \frac{aT}{c}\right)$ eq. 4

Since we will postulate that acceleration and gravity are "equivalent" then gravity will also cause a photon to blue shift according to eq. 4

Actually there is no Doppler component of shifting at all since the Doppler term in eq. (2) has v in the denominator = 0 so that

$$W = W_0(1 + \frac{v}{c}) / (1 - \frac{v}{c})$$
 in eq. (2),
in that case the space craft would actually be accelerating in the opposite direction and this

causing a blue shift. No, a clock does not slow down anywhere on the space craft or anywhere in a gravity field.

NOT SO FAST, Dr. Einstein,
Part XII © 23 Oct 2010 1/3
8:50 AM

$v = \frac{d}{t}$ In reference frames in
uniform relative motion to each
other, an observer in one
reference frame "sees" a different
distance travelled than an observer
"sees" in the other reference
frame. $v = \frac{d}{t}$, using light as
a measuring device, there are
two different available assumptions:

1) Dr. Einstein's assumption
that light speed, as observed by
either observer, is constant.

Since $v = \frac{d}{t}$, this assumption
leads to Dr. Einstein's "logical
calculation that, therefore, time
on one of the reference frames

2/3

must therefore slow down, not
So Fast Dr. Einstein ^{part 1A} shows
shows the obvious

contradiction that time also
and simultaneously speeds up.
Nevertheless Dr. Einstein

flows ahead and uses his

"time slowing down equation"

namely $T = T' \sqrt{1 - v^2/c^2}$

to adjust Maxwell's equations

so that there is symmetry, or

invariance of the equations

between the two reference

frames moving in uniform

motion relative to each other

Dr. Einstein continues to

3/7

ignore the quantum mechanical nature of light in the analysis in his 1905 paper, and, of course, the invariance appears to be conserved.

2) Mr. B.atter's correct analysis that light speed, as measured by the two observers, is not constant and that instead time is constant, or rather the same as measured in both reference frames, also (and concededly) adjusts Maxwell's equations to be invariant. See Appendix 2. Thus, we do not have Dr. Einstein's inconsistent Analysis.

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3/7

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CHAPTER 2

THE ANTI-NEUTRON MODEL OF THE ATOM - Copyright 2011 by Glenn A. Baxter, P.E. 11 July 2011

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ABSTRACT

We propose a simple universal theory/model of the atom composed of anti-neutrons, electrons, positrons, and neutrinos which better explains fusion, fission, radioactivity, electromagnetic radiation, gravity, electric force, magnetic force, and the strong force.

REFERENCES: Not So Fast, Dr. Einstein, by Glenn A. Baxter, P.E. www.k1man.com/b and www.k1man.com/c

Ernest Rutherford from New Zealand, and working in England when he discovered that most of the mass of an atom was contained in the nucleus, was uncomfortable with elaborate theories and was known to say that he did not want to hear any physics that could not be explained to a barmaid.

The so called "Standard Model" of matter is just such an elaborate theory, yet it does not elegantly explain why four hydrogen atoms (four protons with their four electrons) can combine in fusion (like in the sun) to form a helium atom with its two protons and their electrons plus two neutrons, given that helium is lighter than the original four hydrogen atoms yet the two neutrons in helium are heavier than protons.

The anti-neutron model of the atom, introduced here for the first time, does explain all this plus much more. All matter is composed of anti-neutrons, electrons, positrons, and a host of neutrinos. All these particles exhibit a quantum quantity of energy called "spin" in units and half units of Planck's constant divided by 2π known as " \hbar bar." An anti-neutron (spin 0) and a positron (spin $\frac{1}{2}$) form a proton (spin $\frac{1}{2}$). An anti-neutron (spin 0) and an electron (spin $\frac{1}{2}$) form an anti-proton (spin $\frac{1}{2}$). An anti-neutron (spin 0) plus an electron (spin $\frac{1}{2}$) and positron (spin $\frac{1}{2}$) form a neutron (spin $\frac{1}{2}$) plus a neutron neutrino (spin $\frac{1}{2}$). An electron (spin $\frac{1}{2}$) and a positron (spin $\frac{1}{2}$) form a photon (spin 1). All other elementary particles are either contained within the anti-neutron itself, or are formed by combinations of particles within the anti-neutron plus electrons and positrons. That's it!

Note that the so called anti-neutron discovered by Bruce Cork in 1956 has a reported spin of $\frac{1}{2}$ and an isospin of $\frac{1}{2}$. The effective spin of the anti-neutron in this model is defined as $\frac{1}{2}$ minus $\frac{1}{2} = 0$. The Bruce Cork anti-neutron lives in the "Standard Model" anti quark domain, but the newly defined anti-neutron described here lives in the "Anti-Neutron Theory/Model of the Atom" domain.

When four hydrogen atoms combine to form helium in the fusion process, two positrons are excited into higher energy levels and annihilate the two electrons of its atoms to leave behind two anti-neutrons in a nucleus which attach to the nuclei of the other two hydrogen atoms to form helium, the new nucleus being held together by the strong force. Since the two positive protons in the new nucleus strongly repel each other by electric forces, there remains substantial fission energy (like a compressed spring) in the helium nucleus that was obtained (squeezed in) during the original fusion process.

The helium atom formed in fusion is quite a stable atom and, indeed, the helium nucleus is actually a particle in its own right, the alpha particle referenced above, first observed in 1896 when Henri Becquerel noticed that tightly packaged photographic plates were being fogged by radioactive uranium ores. Also being ejected from the uranium were electrons which were called beta "rays."

Now in a star, further hydrogen atoms experience fusion, some completely to form anti-neutrons, and some less completely to form ordinary neutrons. In the neutron forming process, rather than positrons being excited up to combine with electrons, the electrons drop down in energy level, do not annihilate with a positron, and do not form the very high energy annihilation photon which carries off great energy plus the photon spin energy of 1. They stick together by the strong force, and this builds up all the higher elements which contain protons, anti-neutrons, and neutrons. The ordinary neutrons are less stable, and some eject electrons (beta "rays") and antineutrinos during beta decay (the electrons were being held in by the so called weak force which, in the anti-neutron model, is actually just an ordinary electric force such as positive being attracted to negative) thus transmuting the atom to the next higher element since the ordinary neutron thus becomes a proton. Other neutrons combine their electrons with their positrons, emit photons, become anti-neutrons, and thus form more stable (lower energy) isotopes of the same element.

In uranium fission (like the Hiroshima bomb), a neutron smashing into the uranium atom splits it apart, and this releases huge electrostatic energy (as opposed to commonly and incorrectly assumed $E = MC^2$ energy) as the positive pieces strongly repel and violently separate. During this mayhem, many other re-combinations occur, including the shooting out of ordinary neutrons, which strike other uranium atoms and cause the well known chain reaction and also leave a rather radioactive mess behind. Radioactivity is simply neutrons slowly changing to (lower energy) protons and/or anti-neutrons.

Anti-neutrons only exist inside the nucleus. Theoretically, a proton could decay by ejecting a positron to become an anti-neutron, but proton decay has never been observed. Similarly, a proton could absorb an electron to become a free neutron, and free neutrons are fairly common. The closest you can probably come to observing an anti-neutron is as a component part of an alpha particle or helium nucleus, referenced above.

The Copenhagen interpretation of quantum physics is that if something cannot be measured or seen, it does not exist and should not even be discussed. The elementary particle zoo of hundreds of observed atomic particles is just that sort of thing which is covered by the all encompassing anti-neutron. You can smash sub atomic particles together and create all sorts of these observed sub atomic particles as shattered pieces and recombinations of those pieces together with electrons, positrons, and neutrinos, but we will never be able to figure out how such pieces fit together internally to construct the anti-neutron according to the anti-neutron theory or model. Any particle that does not seem to fit within this model can be considered to be “rogue particles in waiting” which will perhaps someday reveal some role that they might have to play in the scheme of things in particle physics.

THE MISSING HIGGS PARTICLE

Still missing in the so called “Standard Model” is finding the Higgs particle (the “God particle”) which, like the anti-neutron, is postulated to also have a spin of 0. Note that in the anti-neutron model of helium, the two positively charged (and therefore strongly repelling) protons are apparently held together by the strong force in the presence of the two anti-neutrons, also in the nucleus. The anti-neutron (and ordinary neutrons, for that matter) thus seem to be intimately associated with the strong force as well as being a majority contributor to the atom’s mass as is also postulated for the Higgs particle. It could be that we have thus found the Higgs particle after all. The Higgs particle is simply the anti-neutron, right in front of our noses!

NUCLEAR FUSION CALCULATIONS

A proton has a mass of 938.3 MeV and a positron has the same mass as an electron of 0.511 MeV. An anti-neutron, therefore, has a mass of 938.3 MeV minus 0.511 MeV = 937.789 MeV. So, four hydrogen atoms combine as follows in the fusion process: $4(938.3)$ hydrogen atoms $>$ $2(938.3)$ hydrogen atoms + $2(937.789)$ anti-neutron atoms + 2 photons. Notice that the helium atom on the right hand side of this equation is lighter by the masses of an electron and a positron which have combined and thus annihilated their two masses completely to form 2 photons of pure energy which just happens to agree with Dr. Einstein’s postulated (for the wrong reasons) formula, $E = MC$ squared. See www.k1man.com/b and www.k1man.com/c

FORCES

The fundamental forces, in order of strength, are gravity (10 to the 40th as strong as the so called weak force), the so called weak force (1/1000 the strength of electric or magnetic forces), the electric force,

the magnetic force, and the strong force (forty times stronger than the electric or the magnetic force). As seen above, the weak force is just an electric force, and the term and concept of the weak force is really superfluous. Thus, the anti-neutron model of the atom uses only gravity, electric, magnetic, and the strong forces.

GRAVITY

There are actually three kinds of gravity. First is ordinary Newtonian gravity that is caused by matter, just as certain types of matter cause electric forces. The second type of gravity is caused by linear acceleration (such as being thrown back in your airplane seat). The third type of gravity is caused by circular motion (such as whirling a tennis ball around at the end of a string). Contrary to Dr. Einstein, linear acceleration gravity and Newtonian mass caused gravity are not equivalent because they are not EXACTLY the same. Mass caused gravity gets weaker as you go away from the mass causing it, or opposite to the direction of the gravity force. Linear acceleration gravity does not weaken as you move in the opposite direction to the direction of the gravity force. Circular motion caused gravity does weaken as you move in a direction opposite to the direction of the gravity force. But gravity seems, nevertheless, to be closely related to motion, and that is why gravity bends light in the same way that motion appears to bend light. It is unclear just how gravity is able to work, and both Newton's and Dr. Einstein's models of gravity just explain what gravity does without explaining how gravity does it. Nor do Maxwell's equations explain how electric and magnetic fields do what they do. Dr. Feynman's diagrams show what particles and so called photons appear to be doing but do not explain how the particles and so called photons manage to do it. Dr. Einstein's geometric model of gravity is a bit more precise than Newton's classic model that is, nevertheless, a very accurate model of gravity and was good enough to get astronauts to and back from the moon. Dr. Einstein's artificial concept of curved space does, however, seem to show that the path of travelling light energy, without mass (so called photons), is bent, since the light, without mass, is simply following a straight line in what is postulated to be curved space which is somehow curved by the presence of mass.

The similarity between gravity, accelerated motion, and the bending of light is intriguing, however. Imagine being in a space ship accelerating upward. A light beam shined crosswise inside the ship would appear to bend downward just as the same beam would also appear to be bent by gravity if the ship were subject to ordinary gravity by simply sitting on the surface of the earth or some other massive body.

But since ordinary mass gravity is not really equivalent to acceleration gravity as Dr. Einstein suggests, this intriguing similarity between accelerated motion and ordinary gravity does not provide any more of an understanding than his curved space explanation does. Mathematically describing a geometrically curved space is one thing, but just how matter generates such curving of empty space is a mystery just as great or greater than what is trying to be explained in the first place.

Dr. Einstein spent his entire life trying to unify the forces of gravity with electric and magnetic forces, but without any success. Dr. Einstein paid little or no attention to the strong force and died long before the foolishness about the so called weak force was invented and Nobel prized time and again.

ELECTRIC AND MAGNETIC FORCES SIMILAR TO GRAVITY AND THE STRONG FORCE

Electric forces seem to be invisible forces of attraction and repulsion. Plus and minus charges attract. Plus and plus or negative and negative repel. Similarly, magnetic forces both attract and repel. Gravitational forces caused by mass only attract. Gravitational forces caused by linear acceleration and circular motion can both attract and repel. How these forces manage to accomplish these attractions and repelling is unclear, even in the standard model, if not much more unclear in the standard model. It is not surprising that how the strong force manages to exert its attractive influence on positively charged protons as well as anti-neutrons and ordinary neutrons in the nucleus is equally if not even more unclear. No theory really explains how any of these forces work satisfactorily. They explain what they do and how much they do it but not how they do it.

See also www.k1man.com/t (110710 12:55P updated 110711, 110712, 110713, 110715, 110716)

ELECTROMAGNETIC RADIATION

A steady electric current through a wire causes magnetic field "lines" at right angles to the direction of flow of the current and circling around the wire. This is Ampere's law. But a steady electric current through the primary of a transformer will not cause a current to flow through the secondary of the transformer. There is induction from primary to secondary only when the primary current is changing, thus causing a change in the magnetic field, according to Faraday's law: $E = -d(\phi)/dt$

Now consider fig.1. An alternating voltage and thus alternating current (ac) at some radio frequency is applied at the center of the half wave dipole antenna at the left of the diagram. Through infinitesimal segment ds flows the current di/dt thus giving rise to a magnetic line of force being generated which "moves" (at the speed of light) from left to right until it strikes the other dipole wire at the right of the diagram at the corresponding infinitesimal length ds' , thus generating an identical but weaker current, di'/dt at that point. The net result of this system is an exact reproduction at the "receiver" connected to the right hand dipole of the signal that was applied to the center of the left hand dipole in fig. 1.

di/dt consists of many electrons being accelerated and decelerated, and thus, the "travelling" magnetic field attributed to a single one of those electrons through one complete cycle would be what we call a photon. The frequency of the "radio" signal applied to the dipole at the left is quite similar to the "frequency" of "light photon" as calculated by $e = hf$. The energy (e) of a radio photon is quite low as compared to the light, X-ray, or gamma ray photons which are generated by non free electrons

associated with atomic activity. In the case of light, the activity is electrons changing their “orbital” energy levels which give rise to most chemical reactions. In the case of X-rays and gamma rays, the activity is electrons changing much greater energy levels within the nucleus. The idea of “orbits” (outside of the nucleus) is a huge stretch but serves well as a model for chemists to use to explain chemical activity, rather well actually. Explaining nuclear activity is similar, with the same idea of electrons changing energy levels. The basic idea is that a faster accelerating or decelerating electron is responsible for the higher energy “photons” as calculated by $e = hf$.

We have a way (above) of gradually turning a magnetic field on and off. The field exhibits its influence at a distance at the speed of light, as we measure the speed of radio “waves” and the speed of light “waves.” As we have seen, radio and light are not really waves at all but rather a “moving” magnetic field which spreads out as the distance increases, a full cycle of the originating accelerating, decelerating, reversing direction and accelerating and decelerating being called a “photon” or single “packet” of moving energy and also a wave. This is how a single photon can go through two separated slits in Young’s experiment. A photon doesn’t really become a complete photon until its expanding magnetic line of force finds an electron to act upon. Coming out of the other side of the two slits in Young’s experiment, are two “new” moving magnetic fields which can interfere like waves when encountering a receiving electron.

If we could turn an electric field and a gravitational on and off in a similar manner, we would find that the field lines of force also travel in a similar manner at the speed of light.

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THOUGHT EXPERIMENT 1.

Consider a free electron B traveling along the x axis on fig. 2 and passing free electron A at x_2 , just when the circular magnetic field line generated by free electron B reaches free electron A which is “at rest” in the fig. 1 coordinate system. The magnetic field is at a right angle to electron B’s direction of motion. The magnetic field “line of force” when reaching free electron A will induce an electric field on free electron A such that free electron A will be “pushed” to the right. What happens at free electron C which is moving along with free electron B? Since the circular line of magnetic force is also moving from left to right at the exact same velocity as free electrons B and C, then the magnetic line of force reaching free electron C does not magnetically induce an electric field at on free electron C since there is no relative motion between free electrons B and C. All that free electron C experiences from free electron B is the “static” electric field of repulsion as though the two electrons were simply adjacent to each other with no relative motion. Thus, for an electromagnetic to fully exist, its magnetic line of force must encounter an electron which has relative motion to it. In short, an electromagnetic wave (or photon) does not exist until its propagating line of magnetic force encounters an electron that has relative motion to it. The wave character of an electromagnetic wave arises as the free electron B reverses direction, typically as a sinusoid.

Consider figure 3. A free electron is shot toward the double slit at the right. The free electron is led by moving electric field lines of force as shown, and thus any given moving electric field line of force passes through both slits simultaneously, and the diffracted electric field lines from the single electron interfere with each other on the other side of the slits and thus form an interference pattern on the screen at the far right.

The mystery remains in explaining just exactly what magnetic field lines, electric field lines or gravitational field lines of force are. We have seen that a moving magnetic field line of force is what we know as an electromagnetic “wave” such as a radio “wave,” X-ray, or gamma ray. The energy contained in given bundle (defined as a photon) of such waves, a bundle being that transmitted in a given amount of time, is the frequency of a pair of lines of force in opposite directions and given by the well known de Broglie expression $E = hf$.

Coming from inside an atom caused by electrons oscillating between different energy states, these bundles of electromagnetic energy come out in discrete multiples of Planck’s constant.

CHAPTER 3

THE EFFECT OF NON CONSTANT SPEED OF LIGHT ON 21ST CENTURY PHYSICS

By Glenn A. Baxter, P.E.

3 August 2011

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SPECIAL RELATIVITY

It was first shown mathematically by this writer, and later supported directly and indirectly in papers by other physicists, that the speed of light is not constant, as was incorrectly postulated by Dr. Albert Einstein in his 1905 Theory of Special Relativity [1] [2][3][7] [8] [9] [10]. This false postulate by Dr. Einstein led him to his improper derivation of $E = MC^2$. See [Not So Fast, Dr. Einstein](#) [1].

Nobel Laureate Frank Wilczek, in his popular book, [The Lightness of Being](#) (Perseus Books Group, New York, 2008), has even raised Dr. Einstein’s famous equation to the status of a universal law he calls “Einstein’s Second Law.” This universal “law” implies that ALL mass is convertible into energy according to Dr. Einstein’s equation $E = MC^2$. **This writer’s 2011 paper, [Anti-Neutron Theory/Model of The Atom](#), [4] shows that only the masses of electrons and positrons convert completely into energy during annihilation such as in the fusion process on the sun. The mass of the anti-neutron itself does not convert into energy. In the anti-neutron theory/model of the atom, all**

stable mass in hydrogen, helium, and the higher elements is accounted for by anti-neutrons, electrons, positrons, and neutrinos,. Unstable short lived particles, of which there seem to be hundreds, play a perhaps very complex and poorly understood role in the otherwise very simple anti-neutron theory/model which applies to most of what goes on in the universe that is of practical interest to us.

In 1928, Physicist (and electrical engineer) Dr. Paul Dirac wrote down the Dirac Equation and predicted the existence of positrons as he set out to wed relativity together with quantum physics by giving a relativistic generalization of the Schrodinger equation. The Dirac equation does incorporate the idea of $E = MC^2$ which supplies a much needed bridge between energy and mass when electrons and positrons annihilate. A purely lucky accident. The existence of the positron does allow a limited but quite different derivation of $E = MC^2$ [1]. In 1932, Carl Anderson discovered the positron during his observation of cosmic rays. Both Dirac* and Anderson received separate Nobel prizes. Incorrect relativity theory pointed Dr. Einstein to the partially correct idea of $E = MC^2$. Dirac embraced this incorrectly derived idea, which does apply to positrons and electrons, and was therefore able to “back into” correctly predicting the existence of positrons. Just luck!

ANNIHILATION

Annihilation is a multiple cancelation process analogous to interference of water waves or adding +1 to -1 to arrive at zero. With positrons and electrons, their + and - charges cancel to zero. Their spins of $\frac{1}{2}$ cancel to zero in the sense that electron spin of $\frac{1}{2}$ plus positron spin of $\frac{1}{2}$ adds to the radiant energy photon's spin of 1 that is carried away in the annihilation process. Their oppositely directed momentum cancel to zero. Finally, their masses cancel to zero. The net result is a complete change of electrostatic energy, kinetic energy, AND mass energy to 100% massless radiation energy, often referred to as so called photons. The conversion of electron and positron masses to energy is quite a “trick,” indeed, and something that the anti-neutrons do not do in the anti-neutron theory/model of the atom.

GRAVITY

The strong force and gravity do attract both anti-neutrons together with electrons, positrons, neutrinos, and photons, however, and both gravity and photons can be generated by accelerated motion. In twined within these accelerated motion connections is the fact that radiation is attracted by gravity. To fully understand this accelerated motion induced gravity generating and radiation generating relationship will be to better understand exactly what gravity is. Dr. Einstein was

definitely knocking on the door with his attempts to examine both uniform and accelerated motions, both absolute and relative.

GENERAL RELATIVITY

As shown in this writer's paper [Anti-Neutron Theory/Model of the Atom](#) [4], Dr. Einstein's geometric model for gravity is just that, a model, which accurately describes the force of gravity but does not really improve on the explanation of how gravity actually works. The general theory of relativity does calculate the perihelion of Mercury more accurately than Newton's classical model, but this can apparently be calculated to similar accuracy in Newton's model using Fourier analysis. [6] The gravity bending of light is also modeled with so called "curved space," but it is not really explained how space gets curved as a physical rather than simply a mathematical manifestation. Gravity force thus remains an enigma along with the strong, electric, and magnetic forces, the latter which are often thought of as Faraday did as "fields." [4] The so called "force carrier particles" of the "Standard Model" do not elegantly explain things much better. Clearly, better theories are needed.

INFINITIES

Nobel Laureate Dr. Richard Feynman explains in his 1986 Dirac Memorial Lecture [4] that particles appear to go backwards in time, that his related Feynman diagrams makes no sense, and he seems to get the correct answers for the wrong reasons. Dr. Feynman further stated in his 1964 Cornell Messenger series lecture, Page 150 [5]:

"Actually no one has a model in which you disregard the proposition about the probability, or you disregard causality, which is also consistent with quantum mechanics, relativity, locality and so on. So we do not know exactly what it is we are assuming that gives us the difficulty producing infinities. A nice problem! However, it turns out it is possible to sweep the infinities under the rug, by a certain crude skill (often called renormalization), and temporarily we are able to keep on calculating."

In the same 1986 Dirac Memorial lectures, Nobel Laureate Steven Weinberg states that "Dirac's great work on the theory of the electron (by his) attempt to unify quantum mechanics and relativity.....today that point of view is generally abandoned..." This writer argues that we should instead rework Dr. Dirac's and Dr. Feynman's equations and not throw the babies out with the bath water. When listening to recordings of Dr. Feynman's famous Cal Tech undergraduate physics course, one can tell that Dr. Feynman waffles when talking about special relativity. He seems to know, deep down, that something is wrong with special relativity but just doesn't have the time or the inspiration to explore it any deeper. The same might be said about most modern physicists. Nobel Laureate Frank Wilczek, in his above referenced book, [The Lightness of Being](#), says on page 41:

“More important for our purposes is another famous relativistic effect, time dilation. Time dilation means that time appears to flow more slowly in a fast moving object. Thus the stuff inside the protons appear nearly frozen in place.....Fitzgerald-Lorentz contraction and time dilation have been explained in hundreds of popular books on relativity, so rather than belaboring them here, I'll just leave them.”

Thus we have a Nobel Laureate citing “hundreds of popular books” to support his MIT and Nobel level physics. Dr. Wilczek has a copy of this writer's paper [1]. Dr. Wilczek's Nobel Prize in 2004 concerned asymptotic freedom in the theory of the strong interaction. This is at the very core of the so called “Standard Model” of the atom which this writer refutes in his paper [Anti-Neuton Theory/Model of The Atom](#) [4].

TIME DILATION AND MASS INCREASE

Special Relativity time dilation and mass increases, caused strictly by geometric relative motion, derived from Dr. Einstein's incorrect postulate that the speed of light is constant, is commonly found as a basic assumption in numerous published physics papers as well as throughout modern physics thinking. All physics and other scientific papers making this assumption, therefore, need rethinking and reworking. In some cases, this reworking will make a huge difference, and in other cases there will be less of an impact.

Also, Dr. Einstein's concept of space-time has no valid basis.

SUMMARY

This writer has presented many arguments to suggest that much of current physics thinking needs rethinking in light of incorrect assumptions relating to both Special and General Relativity as well as the so called “Standard Model” of the atom. Your comments are welcome: Institute@k1man.com

[1] [Not So Fast, Dr. Einstein](#) by Glenn A. Baxter, P.E., www.vixra.org 1107.0027

[2] [Relativity and Quantum Electrodynamics in the Theory of Reference Frames](#) by D. Sasso, www.k1man.com/a

[3] [Using The Law of Conservation of Momentum For Test The Validity of The Special Theory of Relativity](#) by Cochetklov Victor Nikolayevick, www.k1man.com/f36

[4] [Anti-Neuton Theory/Model of The Atom](#) by Glenn A. Baxter, P.E., www.vixra.org 1107.0026

[5] [The Character of Physical Law](#), Modern Library, 1994, New York

[6] [Nahhas' Newtonian derivation of Planet Mercury advance of perihelion of 43" seconds of an arc century](#) – Roger J. Anderton - www.k1man.com/f2.pdf

[7] Explaining Michelson-Morley Without Special Relativity- S. Wagh and W. Wagh, Central India Research Institute, www.k1man.com/f37 waghsm.ngp@gmail.com jetwagh@gmail.com

[8] [Special Relativity: depending on the definition of the momentum of a closed system of bodies from time](#) by Cochetklov Victor Nikolayevick, www.k1man.com/f33

[9] [The Special Theory of Relativity: Linear Example of Infringement of Laws of Preservation of Impulse](#) by Cochetklov Victor Nikolayevick, www.k1man.com/f42

[10] **How Light Speed is Affected by Source Speed** – 2010 - Joseph A. Rybczyk – “....the speed of light is affected by the speed of the light source....” www.k1man.com/f41

* Dr. Paul Dirac shared the 1933 Nobel Prize with Dr. Erwin Schrodinger

CHAPTER 4

$E = MC^2$ and $\lambda = h/p$ Are Not Identities

Copyright 15 September 2011 by Glenn A. Baxter, P.E.

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ABSTRACT

We show that $E = MC^2$ and $\lambda = h/p$ are not Identities, that time is an illusion, and reference just coming to light experimental proof from NASA.

We show in the paper, Not So Fast, Dr. Einstein, (see www.k1man.com/c1) that the speed of light is not constant, and that therefore special relativity is not correct as well as a host of conclusions flowing from special relativity by Dr. Einstein, including the derivation of $E = MC^2$. $E = MC^2$ CAN be derived from theoretical analysis of the annihilation of an electron and a positron, as done in Not So Fast, Dr. Einstein, by temporarily neglecting spin. Then, by including spin, energy is actually greater than shown by $E = MC^2$. Thus, photon energy is “created,” or rather transferred, from electron and positron mutual electrostatic energy, while their charges and masses both cancel out to zero. The fact is that photon energy can also be “created” and radiated from a radio antenna by accelerating electrons in the radio antenna wire without electrostatic charges cancelling and without masses cancelling. In the case of electron and positron annihilation, electromagnetic energy comes DIRECTLY from the electrostatic energy stored in the electric field between the electron and positron before they accelerate as they are mutually attracted, while electromagnetic energy from a radio antenna comes from the fuel driving the electric generator which powers the radio transmitter which is attached to the radio antenna thus accelerating electrons and generating electromagnetic energy which is radiated from the radio antenna. The energy in the fuel, of course, came from fusion on the sun which was the original electron and positron annihilation.

In 1924, Dr. Louis de Broglie assumed the identity $E = MC^2$ to be correct for all matter, and then he directly derived his equation and idea that $\lambda = h/p$ for any particle with mass or even theoretical photon particles without mass. The collection of radical ideas was now that all mass was identical to energy and that all particles, with or without mass, had a characteristic wave length. This neatly linked together the concepts of both waves (photons) and particles, as well as mass and energy. If only physics and nature were that simple!

In Not So Fast, Dr. Einstein, we assumed that Dr. de Broglie’s equation was correct and then derived $E = MC^2$. Dr. de Broglie did the reverse; he assumed $E = MC^2$ to be correct and then derived his famous equation, $\lambda = h/p$ Starting with $E = MC^2$ and Planck’s relationship $E = hf$, where $f = c/\lambda$ and momentum is $p = mc$, then $hf = pc$ and $hc/\lambda = pc$, thus $h/\lambda = p$ or $\lambda = h/p$, which is Dr. de Broglie’s equation.

Suppose $E > MC^2$, as described in the first paragraph above, and $E = hf$, where $f = c/\lambda$ and momentum is $p = mc$. Therefore $E > pc$ and $hf > pc$ or $hc/\lambda > pc$ and therefore $h/\lambda > p$ as described by Z.Y. Wang in his paper $\lambda = h/p$ is universal? [1] There, Dr. Wang analyses photons in a wave guide and concludes that $h/\lambda > p$ as well.

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To: Frank Barkley

From: Glenn A. Baxter, P.E.

1 November 2011

Cc: Emile Rodrigue

Frank,

Following our phone conversation on 29 October 2011, I did listen to your phone message. You referred to a super accurate clock experiment discussed on some TV science show where the clock, just 12 inches higher from the surface of the earth ran faster, in accordance with Dr. Einstein's theory. I believe this is the same experiment referred to in one of those Time-Life (I think) books seen at Wal Mart check out counters about the "100 Greatest, etc., In History" or something to that effect where they claim that the experiment "Proves Einstein's theory" or similar wording. I naturally looked up the paper referenced. See www.k1man.com/f57 It does not offer any such proof as alleged in the Time-Life reference. Popular science writers and producers simply don't understand Special and General Relativity theory.

Is Time An Illusion?

Yes, according to my 10 December 2008 paper "Not So Fast, Dr. Einstein." See www.k1man.com/c1 Contrary to Dr. Einstein, time is not something that can slow down or speed up due to uniform relative motion as theorized in his theory of Special Relativity. General Relativity, however, postulates that gravity can affect light because he says that gravity "bends" space and that light follows a "straight line" in "bent" space. He also concludes that gravity can slow down clocks.

General relativity further postulates that gravity and acceleration are identical. For example, if you were standing at the bottom of a space ship, Dr. Einstein postulates that you could not tell the difference between the ship sitting on earth (with objects being subject to downward acceleration due to gravity) and a ship being accelerated forward by a rocket motor. Dr. Einstein is incorrect since gravity at the bottom of the ship is stronger than at the top of the ship sitting on earth where apparent gravity on the rocket motor accelerated ship would be the same at both the back and the front.

My theory says that gravity will slow down a light wave (light speed is NOT constant), and thus the wave will appear at its destination to be lower in frequency (as though time were running slower at its origin). Thus, a super accurate clock will appear to run faster 12 inches higher off the ground. Same with satellites. A light wave will take more time going up than coming down, and thus the clock on earth will seem to go slower than the one in orbit; nothing to do at all with Dr. Einstein's incorrect theories, although often confused in commonly seen History Channel, etc. pieces.

Now, assume for a minute the super accurate clock described above 12 inches lower really does run slower than the one 12 inches higher from the center of the earth. This would mean that gravity

affects the frequency of vibrations inside matter. Think of the moon circling the earth in a certain amount of time. Think of four super accurate clocks. Clock A is on Earth's surface and clock B is 12 inches higher. Clock C is on the moon surface and clock D is 12 inches higher. The moon orbit takes A ticks, B ticks, C ticks and D ticks, all different. So which is correct? None, since time is an illusion. QED.

There is an intriguing similarity between gravity and acceleration, however, and Dr. Einstein was knocking on the door of something quite interesting. I discuss this in my second and third papers. See www.k1man.com/c2 and www.k1man.com/c3

I hope this responds to your calls.

Glenn Baxter

$E = kMC^2$ As A Special Case For Electron – Positron Annihilation by Glenn A. Baxter, P.E.*

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(Updated 19 January 2012 8:16 A.M.)

(Preliminary paper)

ABSTRACT

We have shown that Dr. Einstein's famous formula $E = MC^2$ is incorrectly derived. See www.k1man.com/c1 We have further suggested that $E = MC^2$ is not an identity, with implications for Dr. DeBroglie's famous equation, $\lambda = h/p$, and Planck's famous equation, $E = hf$, where f is the frequency in hertz and $\lambda = c/f$. See www.k1man.com/c4 We now propose that there exists a k, such that $E = kMC^2$, as a special case for electron – positron annihilation.

ARGUMENT

J.C Valks has recently shown calculations to suggest that, assuming Dr. Einstein's famous mass changing due to uniform relative motion relativistic equation, $m = Mo/\sqrt{(1 - v^2/c^2)}$, is valid, then $k \approx 40$. See www.k1man.com/z We have demonstrated that $m = Mo/\sqrt{(1 - v^2/c^2)}$ is not valid. See www.k1man.com/c1.

Now, assuming that $m = Mo/\sqrt{(1 - v^2/c^2)}$ is not valid, we propose to calculate a new value for k. Actually, $k \approx 40$ is not too bad as it is, because the important thing here is that we have suggested

that $E = MC^2$ is far too simplistic and not generally true for all mass but only true, or nearly true, within the writer's anti-neutron theory/model of the atom. See www.k1man.com/c2

We show in the paper, Not So Fast, Dr. Einstein, (see www.k1man.com/c1) that the speed of light is not constant, and that therefore special relativity is not correct as well as a host of conclusions flowing from special relativity by Dr. Einstein, including the derivation of $E = MC^2$. $E = MC^2$ CAN be derived from theoretical analysis of the annihilation of an electron and a positron, as done in Not So Fast, Dr. Einstein, by temporarily neglecting spin. Then, by including spin, energy is actually greater than shown by $E = MC^2$. Thus, photon energy is "created," or rather transferred, from electron and positron mutual electrostatic energy, while their charges and masses both cancel out to zero. The fact is that photon energy can also be "created" and radiated from a radio antenna by accelerating electrons in the radio antenna wire without electrostatic charges cancelling and without masses cancelling. In the case of electron and positron annihilation, electromagnetic energy comes DIRECTLY from the electrostatic energy stored in the electric field between the electron and positron before they accelerate as they are mutually attracted, while electromagnetic energy from a radio antenna comes from the fuel driving the electric generator which powers the radio transmitter which is attached to the radio antenna thus accelerating electrons and generating electromagnetic energy which is radiated from the radio antenna. The energy in the fuel, of course, came from fusion on the sun which was the original electron and positron annihilation.

In 1924, Dr. Louis de Broglie assumed the identity $E = MC^2$ to be correct for all matter, and then he directly derived his equation and idea that $\lambda = h/p$ for any particle with mass or even theoretical photon particles without mass. The collection of radical ideas was now that all mass was identical to energy and that all particles, with or without mass, had a characteristic wave length. This neatly linked together the concepts of both waves (photons) and particles, as well as mass and energy. If only physics and nature were that simple!

In Not So Fast, Dr. Einstein, we assumed that Dr. de Broglie's equation was correct and then derived $E = MC^2$. Dr. de Broglie did the reverse; he assumed $E = MC^2$ to be correct and then derived his famous equation, $\lambda = h/p$. Starting with $E = MC^2$ and Planck's relationship $E = hf$, where $f = c/\lambda$ and momentum is $p = mc$, then $hf = pc$ and $hc/\lambda = pc$, thus $h/\lambda = p$ or $\lambda = h/p$, which is Dr. de Broglie's equation.

Suppose $E > MC^2$, as described in the first paragraph above, and $E = hf$, where $f = c/\lambda$ and momentum is $p = mc$. Therefore $E > pc$ and $hf > pc$ or $hc/\lambda > pc$ and therefore $h/\lambda > p$ as described by Z.Y. Wang in his paper $\lambda = h/p$ is universal? [1] There, Dr. Wang analyses photons in a wave guide and concludes that $h/\lambda > p$ as well.

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CHAPTER 5

Some material in this chapter is the same as in Chapter 1

EXPERIMENTAL DISPROOF OF SPECIAL RELATIVITY -

By

Glenn A. Baxter, P.E.*

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(From: NOT SO FAST, DR. EINSTEIN – PART VIII (To see the entire paper, see www.k1man.com/c1)

ABSTRACT

We present a simple experiment to verify the new formulas developed in this paper that disprove the Special Theory of Relativity.

RELATIVISTIC DOPPLER EFFECT CORRECTED

If a light source is moving towards an observer in uniform motion, the standard physics textbook formula for the Doppler shift (see The Feynman Lectures On Physics, Vol., 1 Chapter 34, Page 7) is:

$$W = W_0 (\sqrt{1 - v^2/c^2}) / (1 - v/c) \quad \text{eq. (1)}$$

The correct (Baxter Relativity) formula (11) for this situation is:

$$W = W_0 (1 + v/c) / (1 - v/c) \quad \text{eq. (2)}$$

Thus, when $\frac{v}{c} = 0.1$,

the incorrect conversion factor from Dr. Feynman's relativistic Doppler formula is a frequency blue shift of 1.105541597 rather than the correct Baxter relativistic formula giving a blue shift factor of 1.222222222. Not a big difference here, but Dr. Feynman was sucked in (like everyone else) to relative

light speed being constant and thus leading to Dr. Einstein's completely falsely based theory of Relativity. The ramifications of this are huge, since Dr. Einstein's relativity theories are laced throughout most of current physics thinking.

EXPERIMENTAL DISPROOF OF SPECIAL RELATIVITY:

Eq. (1) above represents Dr. Einstein's formula for the Doppler shift, including his relativistic time dilation, between an electromagnetic source (a light source or a radio transmitter) and an observer (or a radio receiver). $(\sqrt{1 - v^2/c^2})$ represents the Einstein relativistic time dilation portion and $(1 - v/c)$ represents the classic Doppler shift portion. Eq. (2) above represents the corrected Baxter relativistic Doppler formula which replaces the Einstein time dilation portion with $1 + v/c$ which represents, instead, the increased relative velocity of light rather than a slowing of time "caused" by relative motion.

In this experiment we use two earth satellites travelling in opposite directions. One satellite has a 30 MHz. transmitter and the other has a receiver. A typical amateur radio transceiver can transmit and receive to an accuracy of 10 cycles per second compared to the 30,000,000 cycles per second of this experiment. We use earth satellites to eliminate any effect that atmosphere or gravity might have on the speed of light.

Both satellites travel at a speed, for example, of 25,000 miles per hour. Plugging 50,000 miles per hour into Dr. Einstein's Eq. (1) above yields a "blue shift" frequency of 30,002,240.24 cycles per second. Plugging 50,000 miles per hour into Eq. (2) above yields a "blue shift" frequency of 30,004,480.62 cycles per second, a full 2,240.38 cycles per second higher, a huge difference, which is easily measureable on any amateur radio high frequency transceiver. Thus we have a very simple and quite elegant disproof of Dr. Einstein's Special Theory of Relativity.

(11) $W = W_o / (1 - \frac{v}{c})$ is the classic Doppler "blue" shift (see The Feynman Lectures On Physics, Vol., 1 Chapter 34, Page 7). Rather than Dr. Einstein's time dilation factor, we, instead use the Baxter speed of light change factor of $\frac{c+v}{c}$ so the total formula becomes $W = \frac{W_o}{1-v/c} + W_o (c + v)/c$ which leads directly to $W = W_o (1 + \frac{v}{c}) / (1 - \frac{v}{c})$ QED It is quite interesting that the Einstein $(\sqrt{1 - v^2/c^2})$ factor causes a slight red shift in opposition to the classic $(1 - \frac{v}{c})$ Doppler blue shift in this situation as the source is moving towards the observer, these opposite effects themselves, being counter intuitive.

By

Glenn A. Baxter, P.E.*

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(To see the entire paper, Parts I through VII, go to www.k1man.com/b Part VIII starts at www.k1man.com/c)

A CLEAR EXPLANATION OF THE BAXTER RELATIVISTIC DOPPLER EFFECT

Imagine a light or radio source at point A in deep space and an observer or receiver some distance away at point B. There is a relative velocity between the two, say 50,000 miles per hour, as discussed in Part VIII. We choose deep space to allow us to neglect all other outside influences. We can consider B as still or fixed with A moving towards B, or we can consider A as still or fixed with B moving toward A. We postulate that these two situations are equivalent.

Further, consider a 30 MHz. radio signal being radiated from A which is moving toward B (at the relative speed of 50,000 miles per hour). The signal is a simple continuous radio wave (CW, still used by radio amateurs using Morse code for communications purposes). Consider the peak voltage of a single cycle emitted as an instantaneous pulse being emitted from point A at time T_0 . When the very next instantaneous pulse during the next cycle is emitted, point A is a bit closer to point B, and since the speed of light is finite, there is less distance to travel, and therefore, will arrive in less time than the previous pulse sent just before time T_0 . The effect is the classic Doppler effect at the receiving end (B) where the pulses are closer together in both space and time and the frequency reading on the radio receiver at point B is higher than 30 MHz., according to the classic formula $W = \frac{W_0}{1-v/c}$. Now, instead of saying that time at point A “slows down” according to Dr. Einstein’s $W = W_0 (\sqrt{1 - v^2/c^2})$, “caused” by relative motion, let us consider point A as being still, or fixed, and point B moving toward point A. Since the speed of light is finite, point B will meet the pulse from point A emitted at time T_0 part way. Right? The relative speed of light is therefore c plus 50,000 miles per hour. Right? This is not rocket science, to use a play on words. You can still say the speed of light has not changed; nobody bothered the light in this situation at all. But B has met the radio pulse part way, and so the relative speed of light between A and B is greater than the speed of light. This is at the heart of Baxter Relativity as opposed to Dr. Einstein’s relativity which insists that the relative speed between points A and B remain the same, and that, instead, time at point A must therefore “slows down.”

Thus we reject Dr. Einstein’s erroneous postulate of the speed of light always being constant for any observer, and we modify the relativistic Doppler formula from $W = W_0 (\sqrt{1 - v^2/c^2}) / (1 - v/c)$ to $W = W_0(1 + v/c) / (1 - v/c)$. See this entire paper at www.k1man.com/b

So, the correct Baxter Relativistic Doppler formula has two things causing the frequency reading at point B to rise, the first is that the distance travelled by the radio or light signal is getting progressively smaller, and second, point B is “catching up” with the signal emitted from point A (or meeting it part way), effectively equivalent to the speed of light being higher rather than Dr. Einstein’s slowing down of time.

Now go back and read this entire paper again. www.k1man.com/b and www.k1man.com/c From his erroneous postulate of the speed of light being constant for all observers, Dr. Einstein builds his entire theory of relativity. Dr. Einstein’s theory of relativity is laced throughout modern physics thinking and this needs to be corrected before we can make further meaningful progress.

PRACTICAL BAXTER RELATIVISTIC DOPPLER EXPERIMENTAL PROOF

The index of refraction is defined as the ratio of the speed of light in a vacuum to its speed in another medium such as air. The index of refraction of air at one atmosphere is 1.0002926. Thus the speed of light that we have rounded in Part VIII of this paper to 186,000 miles per second for $\frac{v}{c}$ calculation purposes, would be reduced from 186,000 to $186,000/1.0002926$ miles per second. Now we calculate the Baxter Relativistic Doppler effect for two ordinary aircraft approaching each other, each with an air speed of 250 miles per hour. Plugging this relative air speed of 500 miles per hour into $W = W_0(1 + v/c)/(1 - v/c)$ now changes a 30 MHz. radio signal transmitted from one of the aircraft and received by the other to 30,000,042.9 cycles per second, still easily measured by any modern amateur radio transceiver. The radio frequency dial would actually read 30.000.04.

NOT SO FAST, DR. EINSTEIN – PART X

By

Glenn A. Baxter, P.E.*

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(To see the entire paper, Parts I through VII, go to www.k1man.com/b Part VIII starts at www.k1man.com/c)

TERMINAL VELOCITY OF LIGHT IN AIR

In Part VIII, we postulated that in deep space, light from a source at point A moving toward a “fixed” point B was equivalent to the light source A being “fixed” with point B moving toward point A. In the latter situation, we saw that point B moving toward point A would meet the light pulse “part way” and this the relative speed of light between the two points was greater than the speed of light, all this happening in the vacuum of deep space.

In air, things will be different. Light is slowed down by any transparent medium in the amount equal to $1/(\text{index of refraction})$, as pointed out in Part IX of this paper. Light is “trying,” but it just can’t go the full speed of light (of a vacuum) as it is somehow slowed down by the medium. Now somewhat analogous to sound, the medium sets a terminal velocity for the light, and NOW the velocity of the source relative to the medium (in this case air) will not increase the relative velocity since the situation here is clearly different than the source at point A being fixed relative to the air with point B doing the moving relative to the air. Now, the experiment in Part IX must be looked at differently.

The two aircraft in Part IX now have separate influences if point A is the source since light from aircraft A will reach the speed of light in air and NOT the speed of light in air plus the speed of the aircraft relative to the air. Aircraft B, however, will still meet the light pulse “part way” as before. The Baxter Relativistic Doppler formula for this situation now becomes:

$$W = W_o \left(\frac{1}{1 - \frac{v}{c}} \right) - W_o + W_o(1 + \frac{v}{c}) / (1 - \frac{v}{c}) \quad \text{eq. (3)}$$

With the first term calculating the classic Doppler caused by the source aircraft A going 250 miles per hour relative to the air plus the full Baxter Relativistic Doppler effect of the receiving aircraft B which is still meeting the light pulse from aircraft A “part way.” Now plugging 250 miles per hour into each of the terms of eq. (3) yields a receiving frequency of 30,000,033.63 MHz., still easily readable on a modern amateur radio transceiver. The radio dial would read 30.000.03.

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CHAPTER 6

(This and furthers chapters are currently being written.)

Consider two space ships, Glenn and Bonnie, way out in deep space at distance of 1,000 miles apart with zero relative motion. Each space ship is outfitted with an acceleration log book. Later, Emile "flies" past and both radio operators radio him that Glenn and Bonnie are now moving closer to each other at

100 miles per hour. Glenn flashes a light toward the Bonnie ship. Is Glenn the one moving and the light is going $c + 100$ miles per hour, or is it Bonnie doing the moving and “catching up” with the Glenn light beam? Both are mathematically equivalent. The light both “takes on” the velocity of the Glenn spaceship or Bonnie is simply “closing in” on the light pulse from Glenn. Both give the exact relative velocity of $c + 100$ miles per hour. This I will call the “**J.A. Rybczyk dual nature of light principle.**” ***Smacks somehow of the dual wave/particle nature of light????? Quantum mechanics here????? See www.k1man.com/f18***

So which is which? Emile docks with both spaceships to investigate further. The logbook on spaceship Glenn shows no record of acceleration. The log book on Bonnie shows one incident of an acceleration of zero to 100 miles per hour. “Ah ha!” says Emile. Are we now into a quantum mechanics parity issue such as with the 1957 Yang - Lee Nobel Prize? Thus, what I call the “J.A. Rybczyk dual nature of light principle,” may turn out to be quite interesting, indeed.

I am starting with the above thought experiment and writing my sixth paper RELATIVITY FOR AGES 9 – 99 WITH EDUCATIONAL LEVELS FROM 4th grade to PhD.

Ernest Rutherford from New Zealand, and working in England when he discovered that most of the mass of an atom was contained in the nucleus, was uncomfortable with elaborate theories and was known to say that he did not want to hear any physics that could not be explained to a barmaid.

CHAPTER 7

THERMODYNAMICS

The science of thermodynamics is very important to physicists.

CHAPTER 8

QUANTUM ELECTRODYNAMICS

This science

CHAPTER 9

PROBABILITY THEORY

CHAPTER 10

QUANTUM PHYSICS

*Mr. Baxter has a degree in Industrial Engineering from the University of Rhode Island and is a Licensed Professional Engineer in Illinois and Maine. He is a graduate of Vermont Academy, which honored him in 1993 as a Distinguished Alumnus with the Dr. Florence R. Sabin Award. It was at Vermont Academy as a student where Mr. Baxter attended a talk and met the very popular relativity author James A. Coleman(7). Mr. Baxter has been doing research in relativity and physics ever since and is currently Executive Director of the Belgrade Lakes Institute for Advanced Research. His current interests include physics, philosophy, and theology.

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NOT SO FAST, DR. EINSTEIN by GLENN A. BAXTER, P.E.

(Complete paper at www.k1man.com/b and www.k1man.com/c)

THE INSTITUTE'S MISSION STATEMENT:

The Belgrade Lakes Institute For Advanced Research was founded in 1999 to study original scientific work of great thinkers going back as far as possible (even thousands of years) to reexamine ideas in search of hints or inspiration which might apply to current scientific progress in physics. The late Dr. Richard Feynman is an Honorary Member of the Institute, and his lectures and publications serve as a corner stone for our work and model for our thinking and efforts. Other examples of great thinkers and scientists would include people such as Michael Faraday, Maxwell, Euler, Cantor, Lavoisier, Lise Meitner, Otto Hahn, Bohr, De Broglie, Planck, Avogadro, Boltzmann, Compton, Schrodinger, Dr. Albert Einstein, Newton, Leibnitz, Pythagoras, Descartes, and many others. Membership in the Institute is by application and majority of votes timely cast by the general membership. For more information call the USA number 207 242 2143 or E-mail Institute@K1MAN.com Articles for the Scientific Journal are invited. Our mail address is Belgrade Lakes Institute For Advanced Research, 310 Woodland Camp Road, Box 440, Belgrade Lakes, Maine 04918 USA www.k1man.com/physics

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Glenn A. Baxter, P.E. at his home in Belgrade Lakes, Maine



Glenn A. Baxter, P.E., at age 4, and his dad, Frank H. Baxter (Mechanical Engineering Bachelor of Science degree and President of Frank H. Baxter Associates, 370 Lexington Avenue, New York City See www.k1man.com/fhb)

WRITING NOTES

NOBEL PRIZE TRAIL

2008 – Nambu/Kobayashi/Maskawa – spontaneous broken symmetry in subatomic physics....the origin of broken symmetry which predicts the existence of at least three families of quarks.

2004 – Gross/Politzer/Wilczek – asymptotic freedom in the theory of the strong interaction

1999 – Hooft/Veltman for elucidating the quantum structure of electroweak interactions in physics

1996 Lee/Osheroff/Richardson - superfluidity in helium 3

1995 – Perl/Reines – Tau lepton....detection of the neutrino

1994 – Brockhouse/Shull – neutron scattering techniques for studies of condensed matter...neutron spectroscopy....neutron diffraction

1990 – Friedman/Kendall/Taylor – inelastic scattering of electrons on protons and bound neutrons, which have been of essential importance for the development of the quark model in particle physics.

1988 – Lederman/Schwartz/Steinberger neutrino beam method....doublet structure of the leptons through the discovery of the muon neutrino

1985 – von Klitzing quantized hall effect

1984 – Rubbia/van der Meer – field particles W and Z, communicators of weak interaction

1980 - Cronin/Fitch – violations of fundamental symmetry principles in the decay of neutral K-mesons.

1979 – Glashow/Salam/Weinberg – unified weak and electromagnetic interaction...prediction of the weak neutral current

1976 – Richter/Ting –discovery of a heavy elementary particle of a new kind

1975 – Bohr/Mottelson/Rainwater – “...connection between collective motion and particle motion in atomic nuclei and the development of the theory of the structure of the atomic nucleus based on this connection

1969 – Gell-Mann – discoveries concerning the classification of elementary particles and their interactions

1968 – Alvarez – large number of resonance states.....hydrogen bubble chamber

1967 – Bethe – Energy production in stars

1966 – Kastler – optical methods for studying Hertzian resonances in atoms

1965 Tomonga/Schwinger/Feynman QED

1964 – Townes/Basov/Prokhorov oscillators and amplifiers based on the maser-laser principle...

1963 – Wigner/Mayer/Jensen – fundamental symmetry principles...nuclear shell structure

1962 – Landau – theories for condensed matter, especially liquid helium

1961 – Hofstadter/Mossbauer Electron scattering in atomic nuclei...structure of nucleons....resonance absorbs ion of gamma radiation....Mossbauer effect

1960 – Glaser – Bubble chamber

1959 – Segre/Chamberlain discovery of the antiproton

1958 – Cherenkov/Frank/Tamm Cherenkov effect

1957 – Yang/Lee parity laws

1956 – Shockley/Bardeen/Brattain Transistor effect

1955 -Lamb/Kusch – fine structure of hydrogen spectrum....precision determination of the magnetic moment of electron

1954 – Born/Bothe – statistical interpretation of wave function

1952 – Bloch/Purcell – “..magnetic precision measurements...”

1951 - Cockcroft/Walton – “...transmutation of atomic nuclei by artificially accelerated particles...”

1950 – Powell - “..photographic method of studying nuclear processes...discoveries regarding mesons...”

1949 – Yukawa – “prediction of the existence of mesons on the basis of theoretical work on nuclear forces...”

1948 – Blackett – “...development of the Wilson cloud chamber method....discoveries therewith in the fields of nuclear physics and cosmic radiation...”

1945 – Pauli - Exclusion principle.

1944 – Rabi – “...resonance method for recording the magnetic properties of atomic nuclei...”

1943 – Stern – “..discovery of the magnetic moment of the proton...”

1939 – Lawrence – “..cyclotronartificial radioactive elements...”

THE BUILDING BLOCKS OF MASS

Atoms were conceived by man as far back as the 5th century B.C. by Greek philosopher Leucippus and in 370 B.C by his pupil Democritus of Abdera who proposed that they were unchangeable, hard, incompressible, nonporous, and indestructible units, each with their own shape and size and in constant motion. Atoms appear today to be the smallest particles of matter that show the characteristic chemical behavior of the element classification that each particular atom belongs to. A large atom is about 1/10,000 the width of a human hair. Obvious evidence of atoms is how a gold class ring wears down noticeably over many years on someone’s finger. Aristotle and many others held differently and suggested that there were only four kinds of things: earth, air, fire, and water. French chemist Antoine Laurent Lavoisier overturned Aristotle’s 2000 year sway on chemistry by proving in his laboratory that oxygen supports combustion; a game changer.

ELECTRONS

THE PARTICLE ZOO – Supplee – P. 136 kaons ? top quark is the last and most massive of the quarks – gluons hold quarks together to form protons and neutrons – particle accelerators generate a bewildering number of mesons and other mysterious particles – there are over 300 –

Light Weight – leptons (Greek word for small) – not affected by the “strong force” - neutrinos and electrons and a more massive electron like particle called muons, initially misclassified as a meson.

Force carrying “bosons” (after Satyendra Nath Bose): photons which carry the electromagnetic “force” and others that supposedly carry gravity, the weak, and the strong force.

Hadrons (including protons and neutrons) from Greek word “thick” or “bulky.” Cal Tech physicists postulated that protons and neutrons were made from quarks with charge $1/3$ or $2/3$ and properties of “up,” “down,” and “strangeness,” “charm,” and “anticharm.”

First family: An electron, its related neutrino, and “up” and “down” quarks make up protons and neutrons.

Second, more massive, family, seen only in high energy collisions: contain a muon, its associated neutrino, as well as the “charm” quark and its partner, the “strange” quark.

A quite hefty electron like lepton, even more massive than a muon, is called a tau. (Theory and symmetry calls for a third family of leptons.

A new “bottom” quark was found and later a “top” quark

In high energy collisions, energy seems to congeal into a host of previously unknown subatomic entities. Head on collisions of particles provide the kinetic energy from both for new particle production which decay rapidly

Early in the century, British physicist C.T.R. Wilson invented the “cloud chamber,” later used by Austrian physicist, Victor Hess, to study cosmic rays and used later by Carl Anderson to discover the positron. A super saturated mist condenses into visible trails when any charged particle passes through with trajectory bending by electric or magnetic fields revealing their charge and mass. In 1952 American physicist Donald Glaser invented the “bubble chamber” where particles cause a liquid to boil along their path. English physicist Cecil Roth adapted photographic to record tracks of particles in the upper atmosphere.

Cosmic ray research turned up mesons whose mass is between that of electrons and protons. An early discovered meson appeared to be the “strong force” carrying particle predicted by Yukawa’s theory but later turning out to be the so called “Yukawa meson,” also discovered in cosmic rays.

SUPPLEE NOTES

INTRODUCTION

Theory demanded that a red hot poker should also emit a large amount of shorter wave length energy, but that does not happen.

Maxwell insisted that there should be ether but Michelson Morley proved the opposite.

What physically happens when current flow? Electron discovered 1887.

Matter and energy are interchangeable. Light is a particle and a wave at different times.

A vacuum is seething with activity as particles pop into and out of existence.

Electrons travel through materials according to complex but comprehensible causes, and sometimes do so without encountering any resistance.

ATOM

ELECTRONS

Joseph John (JJ) Thompson, son of a Manchester bookseller, was elected in 1884 as Director of Cambridge University's Cavendish Laboratory discovered the electron in 1887. If cathode rays were a stream of charged particles, they should be deflected by electric and magnetic fields. By applying a magnetic field from outside coils (Crookes tube) that exactly balance the deflection, he was able to find the ratio of charge and mass of the electron. Once charge was known, mass could be calculated

In 1913, Robert Millikan determined the charge and mass (within 3%) of an electron by measuring the speed of electrically charged droplets falling through electric fields of various strengths.

NUCLEUS

Radioactivity first observed in uranium by Henri Becquerel in 1896.....emissions that left an image on a photographic plate. Ernest Rutherford (a New Zealander at one time under Thompson at Cavendish) found alpha (stopped by paper) and beta (could pass through thin aluminum). Henri determined that beta were electrons. In 1907 Rutherford determined that alpha were positively charged.....helium nucleus ejected from certain unstable elements at $1/20$ speed of light.....shot at a thin layer of zinc sulfide would produce a burst of scintillation at the point of impact. His research assistance Geiger and student Marsden found they could get a bounce back through gold foil by one in a few thousand particles that indicated a massive nucleus $1/100,000$ the size of the atom. Nearly all of the atom was empty space. "It was as incredible as if you had fired a fifteen inch shell at a piece of tissue paper and it came back at you," Rutherford was fond of saying.

In 1919, Rutherford dislodged protons from nitrogen in air which had an equal but opposite charge as an electron.

Maxwell's laws demanded that a circling electron in an atom must radiate and therefore lose energy and thus fall into the nucleus but this does not happen.

Bohr worked briefly in Cambridge with Thompson and in 1912 went to Rutherford's lab in Manchester. He rejected that electrons radiate as they circle the atom and turned to Planck's 1900 idea.

In 1905 Dr. Einstein postulated light was quantized particles of energy, a notion confirmed 20 years later by Compton.

In 1885 Swiss mathematician Johann Balmer had devised a formula that neatly described the relationship among the wavelengths that made up the major lines in the visible hydrogen spectrum (called the Balmer series) Bohr's theory exactly predicted their placement but his model failed to work on more complicated atoms.

One eV is the energy an electron acquires when accelerated across a potential difference of 1 volt.

In 1932, Cockroft and Walton at Cavendish accelerated a proton at 750,000 eV into lithium (third lightest element) which absorbed the proton and split into two separate nuclei of helium (the second lightest element). $P + (3P \text{ and } 6N) = 2(2P \text{ and } 2N) + 2N$ Van de Graaff (American) developed 1.5 million eV. In 1931 Berkeley's Ernest Lawrence invented the cyclotron (5 inches in diameter) which developed 80,000 eV. Larger models quickly followed that developed millions of eV. Later synchrotrons would develop billions and trillions of eV.

Early 1920's de Broglie argued that matter had wave like qualities. Electrons at tens of thousands eV have a wavelength 100,000 smaller than visible light thus electron microscopes first built in 1932 by German physicist Ernst Ruska and first in North America by the physics department at the University of Toronto under E.F. Burton

From the Schrodinger equation, a single electron, even if confined inside solid matter, there is a small probability it can leak outside and enter another solid close by called "tunneling." In 1981, Binning and Rohrer at IBM's Zurich research center made a needle whose tip was only a few atoms thick move over a sheet of gold a couple of atoms width from the surface – they detected a tunneling current from individual atoms to the needle. Their scan could easily detect one atom from another and map the terrain of solid surfaces in fantastic detail.

In 1922 Stern and Gerlach discovered spin (North and South magnetism) on silver atoms; systems of many charged particles have a collective magnetic property or spin unique to each element.

In 1938 American I.I. Rabi found that when beams of atoms are placed in strong external magnetic fields, many of the nuclei try to align themselves to the outside field. But they do so incompletely, wobbling on their axes like a top that is slowing down. If the nuclei are then struck by an electromagnetic wave the same frequency as the wobble (resonant) they will absorb energy and flip their spin states (reverse North and South). This process diverts the molecule from the beam in a way that can be easily measured.

In the 1940s Purcell of Harvard and Bloch of Stanford found other methods to induce and measure this effect. This soon allowed determination the composition of chemical compounds by detecting their resonances; each element has its own resonant frequency. In compounds the resonant frequency

varies in slight but predictable ways as the magnetic fields of different kinds of neighboring atoms influence the target nuclei of the elements in question - allowing NMR to determine the structure of an unknown molecule.

Particle Physics by Brian Martin – Oneworld Publications

P. vii Standard Model – most successful physical theory ever constructed – marriage between theoretical invention and ingenious experimentation P. vii – Idea of quarks – strong interaction binds quarks together – became necessary to postulate the existence of additional quarks...eventually demonstrated via the weak interaction....standard model completed by uniting the weak interaction with electromagnetism. How do particles acquire mass? Most physicists are confident that this problem will be solved soon by new experiments designed to detect the so-called “Higgs boson” P. ix ...strange, unfamiliar concepts, including quarks, gluons, antimatter and forces that seem to have little bearing in everyday life... P. 1 Most of the heavier elements we have today were slowly synthesized in stars...super nova where a star quickly collapses and then ejects most of its mass into space...P. 2 Molecules bound together by electromagnetism P. 3 The last dot in this page is 10^{-5} meters wide and 10^{11} atoms of carbon...to see an individual atom with the naked eye you would have to enlarge it to at least 100 meters...a book has 10^{26} atoms...P. 4. Decay – unstable system transforms to a more stable system with lower energy – There are three types of radioactivity; beta decay caused by the weak interaction (between gravity and electromagnetism) $1/1000$ strength of the latter – the weak interaction controls the rate at which hydrogen is consumed in the sun. In beta decay, neutrinos are emitted...they interact with matter only by the weak interaction and gravity...its mass less than 10^{-9} of the lightest atom....most neutrinos are from the sun...P. 5 ...some from radioactive rocks...a few thousand from atoms in our bodies....Some unstable atoms decay to other atoms by emitting gamma ray radiation....uniform background microwave radiation provides compelling evidence for the Big Bang....P. 6 Electrons have two much heavier siblings, the muon (200 times the mass) and the tauon (tau) (3500 times the mass) Electron, muon, tau, and their neutrino form the lepton (thin) group...the muon and tau spontaneously decay via the weak interaction...play no role in everyday matter and why they appear in nature is a puzzle...a dot would have to be magnified to 5000 km in diameter for the nucleus to be observable by the naked eye....the Bohr model is only qualitatively correct. P. 7 The ratio of the diameter of the sun to the diameter of the Earth’s orbit is one hundred times that of the diameter of a nucleus to the diameter of an atom – that is the fraction of “empty space: in an atom is vastly greater than in the solar system – (?) The Bohr model remains the essential basis of our interpretation of atomic structure, chemistry and biology...Protons and Neutrons, called nucleons, are members of a larger class called Baryons (heavy)...while a proton not bound in the nucleus cannot transform to a neutron, it is possible in some circumstances for a proton in the nucleus to do so. This is because the proton can use the additional energy from the force that binds nucleons in the nucleus. Beta decay occurs if it results in the total energy of the final atom, taking into account the energy due to the binding, being lower than that of the initial atom. The same applies to a neutron bound in a nucleus, whereas a free neutron can always decay to a proton. P. 9 The state of an atom or nucleus which has the smallest possible energy is called

the ground state. Atoms and nuclei can be excited into unstable states, called resonances, by absorbing external energy, rather like the vibrations of a violin string. When the atom quiets and reverts to its ground state, the energy that was absorbed is released in the form of electromagnetic radiation...in 1961 theorists showed that both the ground states and the resonances of particles could be interpreted as if they were clusters of even particles, named quarks by Gell-Mann. Quarks held together by the strong interaction, forty times stronger than electromagnetism. P. 10.

Neutron - spin $\frac{1}{2}$ Electron - spin $\frac{1}{2}$ Positron - spin $\frac{1}{2}$ electron neutrino - spin $\frac{1}{2}$ Photon - spin 1
Proton - spin $\frac{1}{2}$ anti-proton - spin $\frac{1}{2}$ anti-neutron - spin 0 Electron neutrino - spin $\frac{1}{2}$

So, neutron ($\frac{1}{2}$) > proton ($\frac{1}{2}$) + electron ($\frac{1}{2}$) + antineutrino ($-\frac{1}{2}$)

ENTROPY AND THERMODYNAMICS

ENTANGLEMENT AND QUANTUM MECHANICS

PHYSICS OF EVERYTHING

Paul Parsons – P. 120 “Despite the best attempts of scientists to deduce a unified theory encompassing all four forces of nature, at present all their theories remain **UNPROVEN** - in fact, there is no compelling evidence that physics is unified at all.”

The Large Hadron Collider in Cern is looking for the “Higgs boson particle required for **electroweak unification**..... the only missing element of the electroweak theory....The particle was predicted in the early 1960s by British physicist Peter Higgs. His idea was that Higgs bosons pervade the whole of space, and that it is the interactions with this field of particles which gives all other matter in the universe its **mass**. This mechanism is essential in the electroweak theory in order to explain why the particles of the electroweak field (photons) are massless, while those of the weak interaction (known as W and Z) are among the heaviest known.”

P. 118 In 1968, Weinberg, Salam, and Glashow “....succeeded in unifying in unifying.... electromagnetism and the weak force....Experiments in particle accelerators in the 1970’s tallied with the theory’s predictions.....(leading to the) 1979 Nobel Prize.”

This idea of “interactions with this field of particles” is probably fundamental to the weakness of current physics theory. This particle interaction idea as depicted in Feynman diagrams was conceived by Richard Feynman when his brain was wrapped around his own PhD. and Nobel Prize thesis of Quantum Electro Dynamics and the ideas of his hero Paul Dirac: P.78 “Subatomic particles exhibit a property that physicists call ‘quantum spin.’ It is quite different from the spin that we are used to in the everyday world, which is a property of motion, like speed and acceleration. Instead, Quantum spin is a fundamental property of particles, more like mass and electric charge. In 1924, Austrian physicist Wolfgang Pauli proposed a mathematical description of quantum spin. While it seemed to work, even he had no idea exactly what the physical basis for his theory was. That was provided three years later by British theoretical physicist Paul Dirac (an electrical engineer). He was able to derive Pauli’s equations of quantum spin by applying the special theory of relativity to quantum theory.”

Since special relativity is wrong (see www.k1man.com/b and www.k1man.com/c), the above whole house of cards arguably comes down.

PHYSICS NOTEBOOK

- [1] Probability
- [2] Dates
- [3] Cambridge University
- [4] Strange observations
- [5] Electron shell model
- [6] Quotes
- [7] Relativity references
- [8] Newton’s laws
- [9] Huygens

[10] Diffraction (1) P.348 “The thermalized component of neutron flux in a nuclear reactor approximately follows the Maxwell-Boltzmann distribution...the core neutrons therefore have wavelengths comparable to those of X-rays used for diffraction work.”

[11] Euler

[12] Wave theory of light

[13] Thomas Young

[14] Particle theory

[15] Party line

[16] Maxwell

[17] Spin (1) P.441 “Just as nuclei, electrons also have charge, mass, angular momentum, and magnetic moment. In addition to intrinsic magnetic moment associated with its spin, the electron also has a magnetic moment arising from its orbital motion. Thus the electron, in contrast with the nucleus, has a total magnetic moment made up of the spin and orbital magnetic moments....The first experiment interpreted as the absorption of radio-frequency energy during ESR was that reported in 1945 by Zavoisky J. Phys. U.S.S.R. 9, 211, 447 (1945)..... followed independently by.....Cummerow and David Halliday.” Phys. Rev. 70, 443 (1946).

[18] Polarization

[19] Uncertainty principle Great Ideas Today – 1995 – Page 36 caused by indeterminacy but David Bohm thinks it is a measurement problem – The Undivided Universe Routledge 1993, London

[20] Entropy

[21] Principles of statistical mechanics

[22] Brownian movement

[23] Radiation (see 109)

[24] Mostly empty space

[25] Large/small

[26] Cosmic rays

[27] Quarks

[28] Electron volt

[29] Meson

- [30] Schrodinger equation
- [31] Del
- [32] Curl
- [33] Hamiltonian
- [34] Lagrange
- [35] Laplace
- [36] Teach Yourself Calculus
- [37] Logarithms
- [38] Binomial Theorem
- [39] Taylor's theorem
- [40] Euler's formula
- [41] Pascal's triangle
- [42] $Y = 2 X \text{ squared}$
- [43] Conservation
- [44] Photon
- [45] Gluon
- [46] Neutron
- [47] Muon
- [48] Michelson Morley
- [49] Fission/fusion
- [50] Einstein
- [51] De Broglie
- [52] Heisenburg
- [53] Positron
- [54] Proton

- [55] Meson
- [56] Electron volt
- [57] Planet
- [58] Biography
- [59] The elements
- [60] Avogadro's number
- [61] Index of refraction
- [62] Book chapters
- [63] Gamma rays
- [64] Nuclear reactions
- [65] Forces
- [66] Spectral lines
- [67] Beta decay
- [68] Neutrino
- [69] Muons
- [70] Leptons
- [71] Yang-Mills
- [72] Tid-bits
- b[73] Relativity experimental
- [74] Strangeness
- [75] Baryons
- [76] Antimatter
- [77] Lauding relativity
- [78] Color
- [79] Entanglement

- [80] Brane
- [81] Flavor
- [82] Charm
- [83] Dirac equation
- [84] Charge without charge – Asymptotic freedom
- [85] Boson
- [86] Chiral
- [87] Gauge symmetry
- [88] Gluon
- [89] Infinities
- [90] QCD
- [91] QED
- [92] Quark
- [93] Virtual particle
- [94] Double slit experiment
- [95] Standard model
- [96] Relativity problems
- [97] Speed of light
- [98] Light
- [99] Gravity
- [100] Doppler
- [101] Annihilation
- [102] Questions
- [103] Light slowing down/losing energy
- [104] Definition

[105] Infinity

[106] Thermodynamics

[107] Field theory

[108] Speed of light in materials

[109] Radiation - electromagnetic

[110] Weak interaction

[111] Fermion

[112] Sun Energy

[113]

[114] Gluon

[115] Hadron

[116] QED

[117] Interactions

[118] SCAC

[119] Mach's principle

[120] Absolute

[121] Schwarzschild Solution

[122] Large Hadron Collider

[123] Wave Character of Matter – (1) P.334 “The diffraction of electrons from a crystal of nickel in the laboratory of Davisson and Germer in 1927 gave first confirmation to de Broglie’s bold hypothesis of the wave character of matter, and thereby provided the substantial foundation on which to build the wave-mechanical of atomic structure.”

[124] Optical Rotation – (1) P.679

[125] Special Relativity Embedded In Physics (2) P.196 “There is an almost perfect match between the observed properties of quarks and gluons and the most general properties allowed by local color symmetry, in the framework of special relativity and quantum mechanics.”

[126] Chaos Theory – Great Ideas Today 1995 – page 37 “...a butterfly stirring the air with its wings in Beijing today will have consequences for storms over North America in three or four weeks...” Chaos James Gleick Heinemann 1988 London

[127] Causality – Great Ideas Today – 1995 – John Polkinghorne page 38 “...A picture emerges which recognizes two forms of causality at work within the process of the world. One is the interchange of energy between parts, a ‘bottom up’ causality which science describes. But that description is not so tightly drawn as to exclude a second ‘top down’ causality, where the context of the whole effects the behavior of the parts. This latter form of causality is concerned with patterns rather than energy; it has been pictured as the effect of a kind of ‘active information.’ There is a glimmer of possible understanding here of how human minds might interact with the matter of human bodies. It is also a coherent possibility that this is how God interacts with creation with the continuous input of information into cosmic process, giving a hint of how science can accommodate the theological language of the spirit ‘guiding’ and ‘leading’ the world.”

(1) Methods of Experimental Physics, Molecular Physics, Volume 3, L. Marton, Editor-in-Chief, ACADEMIC PRESS, 1962, New York

(2) The Lightness of Being, Frank Wilczek, 2008, Basic Books, New York.

*Mr. Baxter has a degree in Industrial Engineering from the University of Rhode Island and is a Licensed Professional Engineer in Illinois and Maine. He is a graduate of Vermont Academy, which honored him in 1993 as a Distinguished Alumnus with the Dr. Florence R. Sabin Award. It was at Vermont Academy as a student where Mr. Baxter attended a talk and met the very popular relativity author James A. Coleman(7). Mr. Baxter has been doing research in relativity and physics ever since and is currently Executive Director of the Belgrade Lakes Institute for Advanced Research. His current interests include physics, philosophy, and theology.

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(7) RELATIVITY FOR THE LAYMAN by James A. Coleman, Signet, New York, 1958