

Einstein's Simple Mathematical Trick —and the Illusion of a Constant Speed of Light

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Reprint of the article published in *Applied Physics Research* Vol.5, No.4, 2013 August
(Submitted: 2013 May 24 Accepted: 2013 June 25)
Doi: <http://dx.doi.org/10.5539/apr.v5n4p85>
(Journal website: www.ccsenet.org/apr)

Abstract: It is shown how Einstein achieves the **illusion of lightspeed invariance** by employing a simple mathematical trick —and magically abolishing the aether. As if part of a "conspiracy" against man's efforts to obtain knowledge of the physical world, Nature has a "trick" of its own in providing the **illusion of lightspeed invariance**. The illusion works remarkably well, thanks to length contraction and clock slowing both of which are induced by absolute motion with respect to aether. Einstein's illusion and Nature's illusion, however, conceal the physical reality that the one-way speed of light, contrary to a strict interpretation of Einstein's 2nd postulate, is NOT constant.

Keywords: Albert Einstein, DSSU aether theory, special relativity, speed of light, Second postulate, absolute motion, absolute space, aether, length contraction, clock retardation

*As Einstein regarded the situation, the [aether] experiments, seemed to indicate a "conspiracy" on the part of nature against man's efforts to obtain knowledge of the physical world,
—Science writer Lillian R. Lieber (1945)¹*

1. Introduction

In the real world aether exists and serves as the conducting medium of light waves.

One should pay no attention to the contrary assertions that appear in high school and college texts which invariably state that there is no such thing as *aether*. The aether is described as just an old discarded concept; strictly 19th-century voodoo science. One should, however, pay attention to what is written in the research articles of the various physics journals. It is now commonly accepted that the Universe is permeated by aether (a generic term for the space medium). While the existence of aether is not at issue, the properties of aether are subject to considerable debate.

It should also be understood that most professionals are embarrassed to actually use the term "aether," in light of its negative historical connotations. They prefer to use more exotic terms such as *quantum foam*, *cosmic substratum*, *dynamic three-space*, *background substructure*, and others. ... Cannot really blame them. Imagine having to acknowledge that you had it all wrong; and that your profession had it wrong for almost 100 years! This is embarrassing to say the least.

The main reason for the extraordinary delay in recognizing the reality of a space medium can probably be attributed to the remarkable illusion of lightspeed invariance. The details of this illusion will be more meaningful with an initial brief discussion of basic motion.

2. Basic Motion

The most fundamental equation of motion is

$$(\text{distance traveled}) = (\text{speed}) \times (\text{interval of time}).$$

And when rearranged,

$$(\text{interval of time}) = (\text{distance}) \div (\text{speed}), \text{ or}$$

$$\Delta t = \frac{\text{Distance}}{\text{speed}}. \quad (2-1)$$

Consider an airplane making a two-way crossing of a lake on a windy day. (See Fig. 1.) The time-of-travel going *with* the wind will obviously be shorter than the travel time for the crossing going *against* the wind. It is

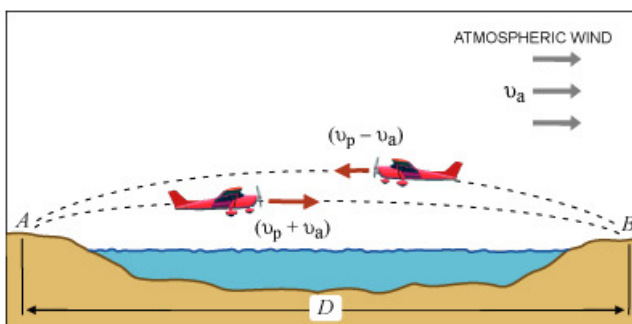


Fig. 1. In the presence of the atmospheric wind, the plane's flight time going from A to B is less than the time going from B to A. (v_p is the air-speed of the plane.)

simply because the plane is flying with a constant speed with respect to the air, but the air itself is moving with respect to the Earth’s surface, including the lake.

During the outbound crossing the speed is, in our example, $(v_{\text{PLANE}} + v_{\text{AIR}})$; and, during the return flight, assuming the wind has not changed, the speed must be $(v_{\text{PLANE}} - v_{\text{AIR}})$. Here, v_{PLANE} is the plane’s speed with respect to the surrounding air. (And v_{AIR} is the atmospheric wind with respect to the Earth reference frame.)

All one needs to understand is that the plane moves at some FIXED speed through the air, while the air itself also moves (as “wind”).

Here are the equations of motion for the flights between runways A and B (as labeled in Fig. 1):

$$\Delta t_{A \text{ to } B} = \frac{D}{v_p + v_a} \quad \text{and} \quad \Delta t_{B \text{ to } A} = \frac{D}{v_p - v_a}. \quad (2-2)$$

Simple enough. Now, it turns out that the propagation of light waves through the aether works in the same way. Light waves pass through the aether—that is, they are conducted by the aether—with a fixed speed of about 300,000 kilometers per second. In shorthand, $c = 300,000 \text{ km/s}$. (Note that symbol “c” is not a variable, it represents a constant of nature.) Meanwhile, the aether itself may be in motion—a motion historically called the *aether wind*.

We now consider a two-clock experiment, like the one shown in Fig. 2, being conducted in a total vacuum, say on the moon. A light pulse is beamed outward across a moon crater and then reflected back to the starting point at A. With the absence of any sort of atmosphere, the speed of the light pulse must be c —the speed of the pulse with respect to aether. Instead of an atmospheric wind, the experiment invokes an aether wind.

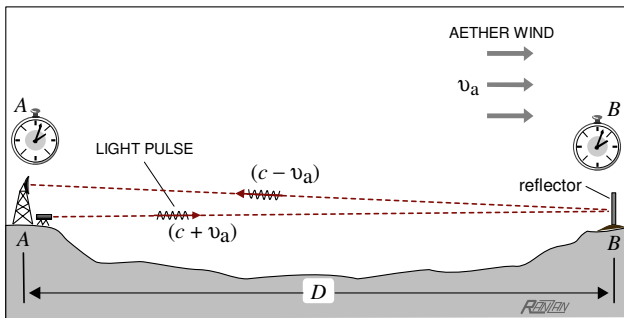


Fig. 2. As a consequence of the "aether wind", the travel time of the light pulse going from location A to B is less than the time going from B to A.

It follows that the two travel-time intervals, between clocks A and B, will be different:

$$\Delta t_{A \text{ to } B} = \frac{D}{c + v_a} \quad \text{and} \quad \Delta t_{B \text{ to } A} = \frac{D}{c - v_a} \quad (2-3)$$

This means that the speed of the light pulse (with respect to the moon-surface frame) is not the same for the two directions. Speed $(c + v_a)$ is not the same as speed $(c - v_a)$. See Fig. 2.

Now here is what happens when an attempt is made to synchronize the two identical clocks, one at A and the other at B: The operator of clock A sends out a light pulse. When the signal is received by clock B it automatically (and instantly) sets to zero and immediately sends a return pulse back to clock A. Upon receiving the return pulse, clock A is reset to read $t_A = \frac{1}{2} \times (\text{two-way travel-time})$; that is, clock A is instantly reset in accordance with the formula, $t_A = \frac{1}{2} (\Delta t_{A \text{ to } B} + \Delta t_{B \text{ to } A})$; and with this reset accomplished, clocks A and B are deemed to be synchronized. (And if there was no motion with respect to aether, i.e., no aether wind, they would then actually be synchronized.) But clock A, with this synchronization procedure, has introduced an error.

Consider clock B: clock B has been set to zero and a fraction of a second later will read $t_{B \text{ at sync}} = D/(c - v_a)$ at the instant of synchronization (the instant at which clock A receives the return pulse).

Consider clock A: clock A is set to read $t_{A \text{ at sync}} = \frac{1}{2} [D/(c + v_a) + D/(c - v_a)]$ at the instant of synchronization.

The error introduced is the difference $(t_{B \text{ at sync}}) - (t_{A \text{ at sync}})$; which is calculated to be,

$$\begin{aligned} \text{Difference} &= \frac{D}{c - v_a} - \frac{1}{2} \left(\frac{D}{c + v_a} + \frac{D}{c - v_a} \right), \quad (2-4) \\ &= D \left(\frac{v_a}{c^2} + \frac{v_a^3}{c^4} + \dots \right), \\ &\approx \frac{v_a D}{c^2} \end{aligned}$$

The latter is the first-order approximation of the synchronization error.[²]

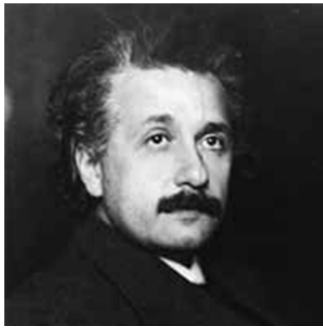
Next, it will be shown how Einstein makes the speed of light the same (constant) for both directions; then later, the details on how Nature actually makes it appear that the speed of light is constant!

3. How Einstein Achieves the Illusion of Lightspeed Invariance

Einstein uses a simple procedure to make the speed of light constant.

First he deems the two travel times to be identical — as if by magic. In his own words (from Einstein’s famous 1905 paper):

... we establish by definition that the “time” required by light to travel from A to B equals the “time” it requires the light to travel from B to A.



Albert Einstein (AIP Emilio Segre Visual Archives)

“... we establish by definition that the ‘time’ required by light to travel from *A* to *B* equals the ‘time’ it requires the light to travel from *B* to *A*.”

(From Einstein's famous 1905 paper, page 40)

He simply declares, $(\Delta t_{A \text{ to } B}) = (\Delta t_{B \text{ to } A})$.

Which is the same as declaring:

$$\frac{D}{c + v_a} = \frac{D}{c - v_a} \quad (3-1)$$

Essentially, this makes v_a equal to zero. (By solving the equation for v_a one finds that $v_a = 0$.) It is in the application of his definition that Einstein disconnects from the real world and makes any speed with respect to aether equal to zero! (In effect, he declares aether to be non-existent!)

Now comes the mathematical part of the illusion. Einstein has a core definition for the fundamentally important concepts of time interval and simultaneity. See the textbox [below](#).

Einstein's Core Definition and Averaging Procedure

Einstein recognized that, in a discussion at this fundamental level, the intuitive notion of time intervals (say, between events at different places) is inadequate. And so, he devised an operational definition of simultaneity and time-interval at different places as follows: Suppose time-intervals at different points (points *A* and *B*) of a given coordinate system are measured by clocks of similar construction; we may then synchronize these clocks by means of light signals. *A* emits a light ray at time t_A by *A*'s clock, it is received and reflected by *B* at time t_B by *B*'s clock, and returns to *A* at t'_A by *A*'s clock. Then *B*'s time t_B is *defined* to be simultaneous with *A*'s time $\frac{1}{2}(t'_A + t_A)$. [Ref³]

Essentially, this says a light pulse's travel time Δt_{AB} , from *A* to *B*, is:

$$\Delta t_{AB} = \frac{1}{2} (\Delta t_{A \text{ to } B} + \Delta t_{B \text{ to } A});$$

and, similarly

$$\Delta t_{BA} = \frac{1}{2} (\Delta t_{B \text{ to } A} + \Delta t_{A \text{ to } B}).$$

This is deviously clever:

Δt_{AB} is made equal to Δt_{BA} —even for cases when $\Delta t_{A \text{ to } B}$ does NOT equal $\Delta t_{B \text{ to } A}$!! Check it with some test values. It's foolproof!

—CR

And Einstein uses it in the simple mathematical trick to achieve the illusion of a constant speed of light:

From his core definition of time interval and simultaneity, a pulse's travel time from *A* to *B* is

$$\text{Time } A \text{ to } B = \frac{1}{2} (\Delta t_{A \text{ to } B} + \Delta t_{B \text{ to } A}) \quad (3-2)$$

But from the basic motion equation, a pulse's travel time is

$$\Delta t_{A \text{ to } B} = \frac{\text{Distance}}{\text{pulse speed}} \quad (3-3)$$

Therefore, combining (3-2) and (3-3)

$$(\text{Distance}) \div (\text{pulse speed}) = \frac{1}{2} (\Delta t_{A \text{ to } B} + \Delta t_{B \text{ to } A}). \quad (3-4)$$

Substituting expressions (for $\Delta t_{A \text{ to } B}$ and $\Delta t_{B \text{ to } A}$) from Eq. (2-3),

$$\frac{\text{Distance}}{\text{pulse speed}} = \frac{1}{2} \left(\frac{D}{c + v_a} + \frac{D}{c - v_a} \right).$$

Apply Einstein's definition —the one that makes v_a equal to zero, and:

$$\frac{D}{\text{pulse speed}} = \frac{1}{2} \left(\frac{D}{c + 0} + \frac{D}{c - 0} \right).$$

Which simplifies to

$$\text{pulse speed} = c.$$

The same argument, of course, applies to the travel time in the opposite direction, from *B* to *A*. And so regardless of the magnitude of the aether wind, the observed speed of light should always be c .

This remarkable mathematical illusion became enshrined in Einstein's second postulate, making the speed of light invariant for any non-accelerating observer.

But what about the real world?

4. How Nature Achieves the Illusion of Lightspeed Invariance

4.1 Part 1

In the real world Δt_{AB} does *not* equal Δt_{BA} . And yet amazingly the speed of a light pulse still appears to be invariant!

Brace yourself for some real magic. As for the mathematics, I promise nothing more complicated than basic algebra.

We again start with the basic equation of motion,

$$\Delta t = \frac{\text{Distance}}{(\text{measured speed})}.$$

The “measured speed” that we are interested in is the *apparent* speed of the light pulse:

$$c_{\text{apparent}} = \frac{2D}{\Delta t} \tag{4-1}$$

Consider the set-up shown in Fig. 3. Ignore the impracticality of trying to use a stopwatch to time the round-trip motion of a light pulse; simply focus on the equation for the apparent speed of light and the two effects that influence it.

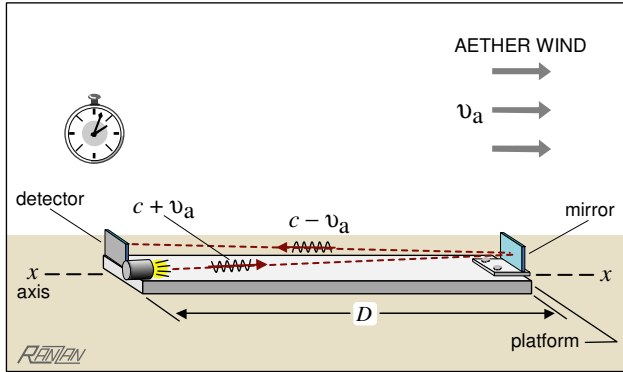


Fig. 3. Method for measuring the speed of light. We already know that the speed of the light pulse is constant c with respect to aether. But what is the measured (the apparent) speed of the light pulse?

Now if we are not careful here we might be tempted to replace Δt with the sum of the two expressions from Eq. (2-3). But we would get the wrong answer —meaning disagreement with actual experimental results.

The reality is that we must take into consideration the affect that the aether wind has on the rigid platform and on the clock.

The pulse being measured has an absolute speed c with respect to aether. The speed v_a is the flow of the aether itself (this is the same as saying that the apparatus frame, in Fig. 3, is moving through the aether with *absolute* speed v_a). Now, to be consistent, object-length D and clock-time Δt must likewise be expressed in terms of their motion *through* aether. In other words, they must be expressed in their aether-altered form.

The problem of measuring the motion-induced contraction of rigid objects:

The problem is that the length of objects (such as that of the platform in Fig. 3) is not something that can be measured directly. If one attempts a carpenter’s method of using a standardized meter stick, one would find that the particular length being checked will always measure the same value —regardless of motion: the numeric value will be the same whether performed while at absolute rest with respect to the aether or while moving at some significant fraction of the speed of light. Keep in mind there is NO Einsteinian relative motion here; the carpenter-experimenter, the meter-stick, and the apparatus-platform are all moving together.

Incidentally, only object dimensions in the direction of

motion are *actually* contracted and NOT spatial lengths.^[4]

The actual contracted length (which is always less than the apparent length) must be calculated. The formula is ^[5, 6]

$$D_{\text{contracted}} = D_{\text{apparent}} / \gamma, \text{ OR} \\ D_{\text{app}} = D_{\text{con}} \gamma \tag{4-2}$$

To be consistent with “absolute” c and “absolute” v_a , everything on the equation’s right side, the *apparent* length and *apparent* time-interval, must be converted into intrinsic terms. This means that both *length contraction* and *clock slowing* must be taken into account.

The conversion expression we need for length is (from [textbox above](#))

$$D_{\text{app}} = D_{\text{con}} \gamma \tag{4-2}$$

Where γ is the gamma factor, $\gamma = 1 / (1 - v_a^2 / c^2)^{1/2}$, also known as the Lorentz factor. In the form $1/\gamma$ it is known as the contraction factor. Notice that it contains the aether-referenced speed v_a . For the derivation, see *The Physical Nature of Length Contraction*^[7]. What is quite interesting, and not well known, is that clock slowing (due to absolute motion) is caused by length contraction (see [textbox, below](#)) and for this reason the gamma factor also appears in the time-interval conversion.

And the conversion expression^[8] we need for time is

$$\Delta t_{\text{real}} = \gamma \Delta t_{\text{app.slow}} \\ \Delta t_{\text{app.slow}} = \Delta t_{\text{real}} / \gamma \tag{4-3}$$

(The “apparent slow” time is always less than, or equal to, the “real” absolute-rest time. Note that γ is always greater than, or equal to, one. But don’t worry about γ , it cancels out in the end.) Next, we apply the conversions (4-2) and (4-3) to expression (4-1), now properly subscripted,

$$c_{\text{apparent}} = \frac{2D_{\text{app}}}{\Delta t_{\text{app.slow}}} \tag{4-4}$$

$$c_{\text{apparent}} = \frac{2D_{\text{con}} \gamma}{\Delta t_{\text{real}} / \gamma} = \frac{2D_{\text{con}} \gamma^2}{\Delta t_{\text{real}}} \tag{4-5}$$

The real round-trip **time**, when expressed with the *real* velocities shown in Fig. 3, is,

$$\Delta t_{\text{real}} = \frac{D_{\text{con}}}{c + v_a} + \frac{D_{\text{con}}}{c - v_a} = \frac{2D_{\text{con}}}{c} \frac{1}{(1 - v_a^2 / c^2)},$$

$$\Delta t_{\text{real}} = \left(\frac{2D_{\text{con}}}{c} \right) \gamma^2 \tag{4-6}$$

Which then allows Eq. (4-5) to be simplified to:

$$c_{\text{apparent}} = \frac{2D_{\text{con}}\gamma^2}{(2D_{\text{con}}/c)\gamma^2} = c \quad (4-7)$$

The *apparent* speed of light equals c which is, of course, a *constant* ($\sim 300,000$ km/s).

Thus, it is the contraction of object length and the slowing of clocks that gives us the remarkable illusion of the constancy of the speed of light under the conditions just described.

The illusion depends entirely on length contraction:

The illusion depends on the aether wind via the length-contraction factor. But what about the time measured by the clock(s)? . . . It turns out that the slowing of clocks is the direct result of length contraction within the components of the particular clock —no matter what components are involved (including, for instance, the atomic-scale parts of atomic clocks, and the bio-tissue of a beating heart). *

Thus the illusion of the constant speed of light (in our example of non-relative motion, with everything being in the same reference frame) is caused solely by the real phenomenon of length contraction.

* There is one exception whereby it is possible to have a clock that “slows” without invoking length contraction: a so-called light-clock in which the light pulses travel **perpendicular** to the direction of motion (in a vacuum). No length contraction is involved. Nevertheless, the “ticking rate” will agree perfectly with an identical light-clock oriented so that the path of the light-pulses is aligned **with** the direction of motion.

For an alternate and more technical proof of the “remarkable illusion” of invariance, the reader may wish to check into Stephan Gift’s article in *Physics Essays* [9].

4.2 Part II: How Nature Achieves the Illusion Even Without Rigid-Platform Length-Contraction

Now what if the speed of the light pulse is measured in a situation in which there is no length contraction? — no rigid platform, separating locations A and B , as we had in Fig. 3?

Say the pulse is to be measured across the distance between the Earth and the Moon. This distance is a vacuum-space distance. It is not subject to length contraction! It is a defining feature of aether theories which are based on the Lorentzian model and it is a defining feature of DSSU theory that *length contraction only occurs in material objects and not in spans of aether space*.

Now to understand the relationship between the “real” distance and the apparent distance we need a simple thought experiment. We consider the vacuum-space distance between the Earth and the Moon.

We let D_{real} represent the Earth-to-Moon “real” distance at the moment when the bodies are aligned with the direction of the aether wind. See Fig. 4 (a). The apparent distance, D_{app} , we measure with standardized rods. Since this is an imaginary experiment we are not concerned that a rigid-rod measurement is outrageously impractical. The important point here is that our measuring rods, being aligned with the aether flow, are

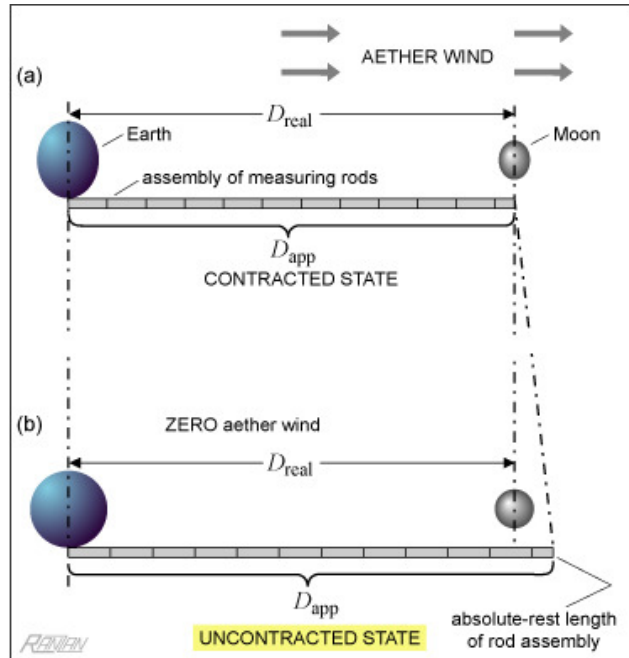


Fig. 4. Thought experiment to compare spatial length with rigid-object length. The “experiment” demonstrates that spatial distance is unaffected by the aether flow; while object lengths are physically contracted in the direction of aether flow. In part (a) it appears as though distance D_{real} is equal to length D_{apparent} . In part (b), however, where the aether wind is imagined to be switched OFF, it becomes obvious that D_{real} is LESS THAN D_{app} . (Less by the proportionality factor $1/\gamma$.)

Note, the effects are exaggerated. The direction of the aether flow, shown in (a), was arbitrarily chosen; the actual direction is, more or less, perpendicular to the plane of the Solar System.

length-contracted; and therefore we cannot say that D_{real} equals D_{app} .

This inequality becomes abundantly clear the instant that we “switch off” the aether wind. In the second part of the thought experiment, the rigid-rod assembly reveals its uncontracted real length the moment the aether wind drops to zero. See Fig. 4 (b). Clearly D_{real} does not equal D_{app} .

Important point: The numerical value of D_{real} (whatever it may happen to be) is the same in both situations (a) and (b) of the figure. It is a reflection of the fact that spatial distances do not shrink (in the context of flat space). Also, but less obvious, the numerical value of the entire rod assembly (whatever the value happens to be) is the same in both situations (a) and (b).

In effect the real length D_{real} has been measured with a contracted length D_{app} (Fig. 4 (a)). What Fig. 4 makes quite clear is that length D_{real} is less than the length of the rigid-rod assembly. That is to say,

$$D_{\text{real}} < D_{\text{app}}.$$

Essentially, the apparent distance may still be treated as a length-contracted distance. Consequently, we may relate D_{real} and D_{app} as was done earlier, in connection with equation (4-2):

$$D_{\text{real}} = D_{\text{app}}/\gamma$$

$$D_{app} = D_{real} \gamma.$$

What all this means is that the analysis of light pulses bounced off the moon is, mathematically, the same as the analysis for the Fig. 3 scenario (except that D_{con} is replaced by D_{real}). The apparent speed of light is still predicted to be constant. And real experimental evidence *does* back-up the prediction.

Thus, the illusion of lightspeed constancy is maintained even when there is no shrinkage of the distance between the emission/measuring point and reflection point.

So, what then is the secret behind the magic of this illusion? ...Well, the illusion only works when a two-way light-path method is used. Note, however, that the two-way light-path method is not always obvious. Imagine, for example, a one-way light-path set-up. The light pulse is timed from the moment it departs from distant point B to the split-second instant it is received by the observer at A . For this to work, the clocks at A and B must obviously be synchronized. And there's the catch. You see, in order to synchronize those clocks, one has to follow Einstein's defined procedure (see Section 3 textbox, *Einstein's Averaging Procedure*). And doing so requires a two-way light-path method. There really is no other way. It is a *catch 22*, if you will.

The result is a built-in, cleverly hidden, synchronization error; and the illusion of invariance still holds. It still fools the audience.

But in the real world ...

5. In the Real World

The astute reader, at this point, might claim that the above analysis of Fig. 3 could also be interpreted as proof that Einstein was right; that v_a equals zero, or even that there is no aether and no aether wind.

But no, *that* interpretation is not an option. It is not an option because the one-way speed of light has been shown, by actual experiments, to be VARIANT. That is, the propagation speed of the pulse from A to B is NOT the same as the speed from B to A .

This difference can *only* arise in the presence of a light-conducting aether which is in motion!

In the real world the actual one-way speed of light is not constant.

Notwithstanding the observable illusion described in the previous section, the real world speed of light is not invariant. In the real world the actual one-way speed of light *varies* with the aether wind!

Here is a selection of the experimental evidence and supporting theory. The experiments detailed by the various authors somehow manage to overcome Einstein's clock-synchronization problem, which usually

contaminates one-way lightspeed measurements. [¹⁰, ¹¹, ¹², ¹³, ¹⁴, ¹⁵, ¹⁶, ¹⁷]

One such experiment, the Marinov (1974, 1977a, 1980b) coupled-mirrors experiment, has been described as "one of the most brilliant and ingenious experiments of all time. It measures the very small quantity v/c , where v is the absolute velocity of the observer, by using very clever stratagems." The coupled-mirrors experiment demonstrated that the absolute velocity of the Solar System v , is of the order of 300 ± 20 km/sec, and that the speed of light is $c - v$ in the direction of motion of the Solar System, and $c + v$ in the opposite direction. [¹⁸]

Let me also stress the real-world nature of *contraction* due to motion. There is a distinction between *intrinsic* length contraction and *apparent* length contraction of objects. The formalism of Einstein's relativity ignores the aether; hence when it comes to the "contraction effect" it deals only with the *apparent* length contraction, which contraction is not necessarily real since it varies for different inertial observers when considering the same object. Einstein's length contraction depends only on relative motion; while *intrinsic contraction* depends only on motion with respect to the aether space-medium.

As pointed out in the introduction, while the existence of aether is not at issue, the properties of the aether are of considerable interest and of fundamental importance. The aether of our Natural world, the aether that follows from the above discussion, serves as the space medium and has the following properties: permeates the Universe, conducts electromagnetic effects (such as light and charge), contracts material lengths, and slows clocks. We then add the feature that this aether medium offers no resistance whatsoever to uniform motion. If this were not so, then the Earth would have spiraled into the Sun long ago.

So far we are within the bounds of standard physics (although our view is somewhat unconventional). But now if we ascribe to this aether the fundamental ability to impart the property of mass, if we make this aether a participant in a *sui generis* mass-bestowing process, then some remarkable implications follow. Explaining how this process comes about, and the extensive implications, is the purpose of DSSU theory.

6. Implications of DSSU Aether

The implications of this new aether for particle physics, for instance, are considerable. DSSU aether is postulated to be involved in a new fundamental process of energy as well as the mass bestowing process. This provides a simple and elegant, fundamental and qualitative, unification of mass and energy. With the new aether-based understanding of the property of mass — which does not require a new field particle — one is able to avoid the unscientific circular logic in trying to explain: *what gives the recently "discovered" Higgs particle its own mass?!* What indeed.

The postulated *mass process* then paves the way for a

new theory of gravity. With DSSU aether as the participant in mass and energy acquisition, we are led, without any additional theorizing, to a remarkably compelling mechanism for gravitation. Within the astonishingly simple properties of DSSU aether, there lies the simple and elegant causal mechanism of gravity. Keep in mind, neither Newton's gravity nor Einstein's gravity specified a causal mechanism!

With a process-type theory of gravity, the term "force" only has meaning on the macro-scale. On the micro-scale, on the subatomic scale, the term "force" as applied to gravity has no meaning. In other words, the gravity effect does not need force carriers; and therefore, THERE ARE NO GRAVITONS.

Needless to say, there are cosmological implications.

The unique DSSU space medium, serving as the universal conducting medium of photons (both as free radiation and as self-confined into mass particles), agrees with important aspects of special relativity (as detailed earlier), while also serving to unify the processes of energy, mass, and gravitation. And with an understanding of gravity, one holds the conceptual key to understanding the Universe.

The implications for cosmology are as far-reaching as they are profound. The dark matter mystery is easily resolved; the cause of galaxy rotation becomes self-evident. The explanation for these may be found in the article, *The Story of Gravity and Lambda —How the Theory of Heraclitus Solved the Dark Matter Mystery* [19]. When the axiomatic properties of the aether are exploited, their consequences uncovered and unambiguously linked together, what emerges is the powerful new cosmology: *The Dynamic Steady State Universe*. For the first time in history, it is possible to show qualitatively a clear and direct link between gravitation and the electromagnetic

effect. There is a profound implication here. In assessing recently completed research on this, one of the anonymous reviewers stated, "This paper [on the cause and mechanism of gravitation] presents an interesting and intriguing analysis of a possible new explanation for gravity based on a new cosmology known as the Dynamic Steady State Universe. I think the ideas deserve some consideration by the general physics and astronomical communities." The profound implication is that the real world is constructed on a single fundamental force.

7. Conclusion

Whether you are a student or a teacher or a researcher, this should be of concern. Your text books are wrong.

The glaring factual error in most textbooks is the claim, "It is impossible to detect our motion relative to the aether." Also in error is the claim that the famous Michelson-Morley experiment had a "null result." The truth is, Albert Michelson and Edward Morley *did* measure an aether wind—it was merely less than had been expected. They had simply failed to take into account the physical length contraction of their apparatus, (a phenomenon of which they were unaware at the time).[20]

The fact is lightspeed invariance is merely an illusion. The illusion depends on the measuring method.

What you need to know is that the ONE-WAY speed of light has long been proven to be non-constant. [References #9 to #17]

The one-way speed of light is not what Einstein's postulate says it is. □

REFERENCES

- ¹ Lillian R. Lieber, *The Einstein Theory of Relativity* (Holt, Rinehart and Winston, New York, 1945) p 20
- ² O. Darrigol, *The Genesis of the theory of relativity*. **Séminaire Poincaré** Vol.1: 1-22 (2005) p10. Posted at: <http://www.bourbaphy.fr/darrigol2.pdf>
- ³ Mary B. Hesse, *Forces and Fields, a study of action at a distance in the history of physics* (Littlefield, Adams & Co., Totown, New Jersey, 1965) p231
- ⁴ J. Lévy, *From Galileo to Lorentz... and Beyond, Principles of a Fundamental Theory of Space and Time* (C. Roy Keys Inc., Montreal, Canada, 2003)
“It should be pointed out that according to the Lorentz assumptions, it is matter that is contracted, not space.” –Lévy, p41
- ⁵ C. Ranzan, *DSSU Relativity –The Lorentz Transformations Applied to Aether-Space*. **Physics Essays** Vol.23, No.3, p520 (2010); doi: <http://dx.doi.org/10.4006/1.3476412>.
Posted at: <http://www.CellularUniverse.org/>
- ⁶ C. Ranzan, *The Physical Nature of Length Contraction –the DSSU Theory of Length Contraction Induced by Absolute Motion*. **Applied Physics Research** Vol.5, No.1 (2013); doi: <http://dx.doi.org/10.5539/apr.v5n1p87>. Posted at: <http://www.CellularUniverse.org/>
- ⁷ Ibid.
- ⁸ C. Ranzan, *DSSU Relativity –The Lorentz Transformations Applied to Aether-Space*. **Physics Essays** Vol.23, No.3, p520 (2010); doi: <http://dx.doi.org/10.4006/1.3476412>.
Posted at: <http://www.CellularUniverse.org/>
- ⁹ S.J.G. Gift, *Light Speed Invariance is a Remarkable Illusion*. **Physics Essays** Vol.23, No.1, 2010; doi: <http://dx.doi.org/10.4006/1.3280803>
- ¹⁰ F. Selleri, *Noninvariant one-way velocity of light*. **Found. Phys** 26, 641-664, 1996; doi: <http://dx.doi.org/10.1007/BF02058237>.
Posted at: <http://adsabs.harvard.edu/abs/1996FoPh...26..641S>
- ¹¹ S.J.G. Gift, *One-Way Light Speed Determination Using the Range Measurement Equation of the GPS*. Posted at: <http://vixra.org/pdf/1008.0035v1.pdf>
- ¹² S.J.G. Gift, *One-Way Light Speed Measurement Using the Synchronized Clocks of the Global Positioning System (GPS)*. **Physics Essays** Vol.23, No.2, pp271-275, 2010; doi: <http://dx.doi.org/10.4006/1.3361840>
- ¹³ S.J.G. Gift, *Light Speed Invariance is a Remarkable Illusion*. **Physics Essays** Vol.23, No.1, 2010; doi: <http://dx.doi.org/10.4006/1.3280803>
- ¹⁴ S.J.G. Gift, *Doppler Shift Reveals Light Speed Variation*. **Apeiron** Vol.17, 13, 2010
- ¹⁵ S.J.G. Gift, *The Relative Motion of the Earth and the Ether Detected*. **Journal of Scientific Exploration** Vol.20, 201, 2006
- ¹⁶ A. Kelly, *Challenging Modern Physics* (BrownWalker Press, Florida, 2005)
- ¹⁷ M. Sato, *The Velocity of Electromagnetic Wave is Observed Differently Depending on the Observer's Velocity*. **Physics Essays** Vol.23, 405, 2010; doi: <http://dx.doi.org/10.4006/1.3452472>
- ¹⁸ J. Lévy, *From Galileo to Lorentz... and Beyond, Principles of a Fundamental Theory of Space and Time* (C. Roy Keys Inc., Montreal, Canada, 2003) p49
- ¹⁹ C. Ranzan, *The Story of Gravity and Lambda –How the Theory of Heraclitus Solved the Dark Matter Mystery*. **Physics Essays** Vol.23, No.1, p75-87 (2010); doi: <http://dx.doi.org/10.4006/1.3293983>
- ²⁰ C. Ranzan, *Extended Relativity –Exploiting the Loopholes in Einstein's Relativity*. **Physics Essays** Vol.25, No.3, p327-346 (2012); doi: <http://dx.doi.org/10.4006/0836-1398-25.3.327>