Aetherial Speculations
Version 1
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1. Introductory Comments. Other online papers on this webpage discuss a new aetherial theory. Those papers discuss how the theory meets all present-day experimental tests and also propose a new test. Here I will now turn to some "science-fiction" possibilities, discussing some speculative ideas concerning the use of aetherial science, even though at the moment we may not know how to achieve that potential. I hope that this science-fiction will lead many to delve into the actual science material contained in the online papers. As will be seen, aetherial science is full of promise!

For those new to the concept of the aether, it is a substance theorized to exist throughout all of space. You can think of it as kind of like the air around you, except that the aether is a solid, not a gas. Also, unlike the atmosphere, which begins at the earth's surface and gradually dies off as you go out into space, the aether exists with an approximately constant density into the center of the earth, and it exists all the way out through distant galaxies. In aether theory, light is a wave on the aether. (It is the motion of the aether that is doing the "waving".) The aether is not a new idea, as it was the dominant idea before Einstein. My work however is new, as I extend the classical concept of a luminiferous aether into the quantum realm, and I also propose that the aether has internal tension as well as new fields I call the delta and gamma fields. I then show how that simple physical model leads to all the known laws of physics concerning gravity and electromagnetism.

I should next mention some of the falsehoods told (and mistakenly believed) about the aether as well as its competitor, relativity. Often, it is proclaimed that particle accelerators and GPS could not work without using relativity in their design. This is false. The truth is that accelerators and GPS are designed using Maxwell's Equations, the Lorentz Force Equation, and the Lorentz Transformation Equations. Those equations were developed by Maxwell, Lorentz, and others prior to relativity. It is true that Einstein also derived the Lorentz Transformation Equations from a relativistic footing, but Lorentz did it first, and Lorentz did so from an aetherial footing. Einstein's special relativity and the earlier Lorentz Aether Theory end up with identical equations, and therefore accelerators and GPS systems can be designed without relativity.

Another falsehood widely told and mistakenly believed is that the Michelson Morley test disproved the existence of the aether. The truth is that if one uses the Lorentz Transformation Equations, a null result of the Michelson Morley experiment is expected. And since the Lorentz Transformation Equations were derived by Lorentz and others assuming an aether, the Michelson Morley test certainly does not disprove the existence of the aether.

With those preliminaries of science fact now mentioned we'll now leave the world of science fact and delve into the world of science fiction.

2. Achieving Aetherial Control - Step One - Forming Aetherial Bubbles. Before getting into some of the intriguing possibilities that might be enabled via aetherial control, we should begin by identifying how we might actually start to achieve bulk aetherial control. In The Quantum Luminiferous Aether it is proposed that the aether is made up of two equal and opposite solids.

When small chunks of those solids that get separated away from the normal solid body, those small chunks are shown to contain electric charge. That is, it is found that electric charge IS the aether; the only thing different about electric charge is that it is free aether, while normally the aether is bound up into two big solid masses. (Free aether and normal aether also have mass and some spin, but those are details we need not worry about here.) The separated chunks of aether (the charges) can move around within the normal solid surroundings, similar to how electrons can move inside of solid wires.

We can next envision making a shell of charge, and such a shell of charge may, if it is dense enough, isolate and separate the solid aether within the shell from the solid aether outside of the shell. You can think of it as being similar to a plastic beach ball with the plastic isolating the air inside from the air outside, but instead of air we have solid-aether and instead of plastic we have charge. (Recall that charge is free aether.) And therefore, our first step toward gaining aetherial control is to make a shell of charge. To begin our speculations, we'll assume that we make one shell of charge by using a hollow electron beam. This will form a boundary around one aetherial component and isolate it.

Recall now that the aether has two components. Hence, we'll also need to make a shell of positrons to isolate and separate the second component of the aether inside and outside of our shells. (Positrons are the anti-matter equivalent of electrons.) By using a hollow positron beam as well as a hollow electron beam we could in principle fully isolate the two-component aether inside and outside of our beams. If we focus those two hollow beams so that they cross themselves twice, this would create an aetherial-bubble. The shape of the bubble would resemble an American football, with the two pointed regions being those places where the beams cross upon themselves. We know how to make electrons and positrons into hollow beams. We also know how to focus such beams using solenoid magnets. Hence, it is theoretically possible to make shells of free positive-aether and free negative-aether (positron and electron beams) that could isolate one region of aether away from the rest of it. Theoretically, we could make an aetherial-bubble, and that could lead to some interesting possibilities.

Now, a rather important question remains. Just how dense must the electron and positron beams be? And herein lies a problem. We don't really know. Nothing in the theory tells us how exactly dense the aether is. (More on this is discussed in section 8 below.) So we really don't know how intense our electron and positron beams need to be in order to isolate our aetherial bubble. If it is the same as solid densities, our task to make an aetherial bubble out of beams will be well beyond present technology, and if it is the same as nuclear densities it would be even more difficult. But for our initial speculations, we'll just assume that the density is much less, so that our science-fiction story is within reach of presently available technology.

A second issue pertaining to the creation of an aetherial-bubble is that electron beams and positron beams are inherently "hot". In this case, "hot" means that there is significant internal random motion. Hence, if we try to make shells of charge with such beams in order to make our aetherial-bubble, it would be possible for holes to open up in the shells due to the random motion of the particles in the beams. And holes in the shell would preclude a clean separation between the inside and outside of the aetherial-bubble, defeating effort purpose. Yet, if the density of the aether is small enough, this latter problem could be overcome by beams of high enough density so that the probability of a hole is very, very small. Certainly, substantial technical hurdles exist, but for our

present purposes we see that forming an aetherial-bubble is at least within the realm of speculative possibility, and so we'll continue with our speculations.

3. Moving our Aetherial-Bubbles. So we've just seen how we might be able to separate out a portion of the aether to make an aetherial-bubble, but the practical use of aetherial control technology will come only if we can move the aetherial-bubbles once they are formed. To move them, we would need to move the positron and electron shells that form the boundary of our bubbles, and it is well known how that could be done: by changing the magnetic fields of our focusing magnets in just the right way, we could, in principle, move the separated aether through the normally existing background aether. Note that even if the needed densities are achievable, generation of positron beams is not trivial, as it involves the generation of large numbers of the anti-matter equivalent of the electron. But, while not trivial, such beams are routinely made in labs. And once the beams are formed we could indeed move our aetherial-bubbles simply by changing the magnetic fields we use to focus our beams.

4. Aetherial-Transporters. The first technological advance that aetherial control devices may lead to involves simple transportation. In the original "Star Trek" science fiction, "transporter beams" involved a scrambling of the atoms that make up something (often a person) and then "beaming" those atoms to a place where that something is reconstructed. That concept has never been one that could hold up under much scrutiny, since the information content required to do it, along with energy concerns about disassembly and reassembly are quite problematic. But an aetherial-transporter is a different idea entirely. In an aetherial-transporter, beams of electrons and positrons would surround the aether itself as well as anything and everything inside of it. Then, the aetherial-bubble would be moved, carrying its contents with it. Once at its destination, the electron and positron beams would be turned off, and the contents would now exist in a new place. In many ways it is not that different from transport via an elevator. In an elevator, you get into a shell and the air within the shell can move along with you. In an aetherial-transporter you get into a shell (an aetherial-bubble) and the aether within the shell moves along with you. No large amount of information is needed, and there is no disassembly and reassembly of your atoms required.

Aetherial-Transporters would lead to a tremendous improvement in many areas of life. Roads would no longer be needed, with no more road kills of wildlife. Instead of roads, we would need large pipes to contain our electron and positron beams along with magnets and stands to properly guide our aetherial-bubbles from place to place. Garages would no longer be needed. Nor would parking lots. Instead, travel destinations would only need aetherial-terminals for people and things to move into and out of the aetherial-bubbles.

One of the biggest advantages of aetherial-transporters may be the time it takes to travel. It may be possible to move our aetherial-bubbles at speeds approaching, or even exceeding, the speed of light. (The reason for the speed-of-light limit is because of effects within the aether. If we move the aether itself, this limit may no longer apply.) Travel time reductions would result in huge and beneficial applications for mankind. All of the hours spent commuting would be gone, as people could step into their pod and be transported in minutes to whatever destination they desire. The time spent traveling might be dominated by the time it takes to get to the nearest pod, and from the destination pod to the real destination, plus any waiting for scheduling of the aetherial transport.

If desired, people could likely go home (or to Paris) for lunch, even though they work 50 (or 5000) miles away. Trips from NY to LA, or from Chicago to Tokyo, could possibly be done in minutes.

The wonderful advances postulated for aetherial-transporters do present a safety concern of course. Inside the aetherial-bubble everything will be perfectly safe, as you'd be surrounded by a shell, and everything inside would be perfectly "normal". And inside the pipes (carrying the electron and positron beams in a vacuum) all will be well, since all aetherial-bubbles in any pipe will go at the same speed and direction so that collisions should not happen. But what happens if a pipe leaks, or a magnet fails? In such a case, catastrophe may ensue. A pipe leak may cause the electron and positron beams to fail, as would a magnet failure, and such a situation would likely crash the transport. Significantly more engineering will be needed to ensure that our aetherial-transporters safely handle system failures. So even if the physics proves favorable, there is a lot of work to do.

5. Aetherial-Cars, Aetherial-Spaceships and "Star-Drive". As mentioned above, an aetherial-transporter is somewhat similar to an elevator: a shell is formed that surrounds that which is being transported. But there are significant differences. In an aetherial-transporter, a bubble of aether would be formed within the normal aether that occupies all of space, and that bubble would then be controlled to move through the other, normal, aether. And that means that it is possible that solid objects that exist elsewhere in the normal aether may even be split, and then expand and flow around the aetherial-bubble and then recombine once the aetherial-bubble passes through them. (Those solid exterior objects exist within the "outer" aether, while we are in an "inner" aether of our bubble.) If that proves to be the case, travel in an aetherial-bubble would involve traveling along with the aether inside the aetherial-bubble; we would not travel through the normal aether as we do now, instead we would move it out of our way. This implies that the entire process could be very safe, as the bubble would simply guide to the side anything that might otherwise collide with us along our travels.

Of course, we'd like to move beyond the use of external vacuum tubes and magnets to contain and focus the electron and positron beams. Section 4 has just discussed what is a mass-transportation system. But what we'd really like is to have an aetherial-car, so that we can steer our aetherial-bubble and move it as we like, and not be constrained by some pre-existing pipe network. To do that, we'll need to generate our electron and positron shells "from the inside". Once we make that leap, aetherial-transport will be a "tunneling through" of what already exists with no external apparatus required. Our aetherial-car could tunnel through an oncoming train, or even an entire planet or a star. Inside generation of our positron and electron shells would result in a very safe and effective travel system.

Could we set up electron and positron beams on some internal platform, and then steer those beams to surround us? And could we keep all of the magnets and vacuum systems internal to the aether within the electron and positron shells, so that there would be no need for a large infrastructure of pipes to enable transport? If we are already in outer space, we have an external vacuum surrounding us. It is certainly theoretically possible to form electron and positron beams from the inside of an aether-car, although bending them into completed shells may require some additional inventiveness. But once we have a self-propelled aether-car, with all of the aetherial-shell generating equipment on the inside, it is possible to consider a larger version of an aetherial-car that would contain living quarters, kitchens, food supplies, internal power, and all of the other

things needed for a group of people to engage in deep space exploration. That is, self-enclosed aether technology would allow us to build an aetherial-spaceship.

An aetherial-spaceship is a possible practical result of aetherial control that could enable future space travel. Presently the scientific consensus (a first oxymoron) of settled science (a second oxymoron) believes that there is a universal speed limit: nothing can go faster than light, at least not anything near the earth. This is a result of relativity. But once we set relativity aside and accept an aetherial model, other possibilities arise. Perhaps we can move the aether in such a way so as to overcome the speed of light limit. This opens up intriguing possibilities.

Next there is the problem of propulsion. Here, it is important to remember that the way the proposed aetherial-transporters work (see above) is to have magnets that dynamically focus the beams so that the shells move through space. How could we do that from the inside? We likely can't. So we need some other way to get our spaceship to move. One way to do that may be to form our electron and positron beams into a gear-tooth shape. After all, our positron and electron shells are moving through the background aether, and perhaps we could use that background aether as a "footing" from which to push our starship through. But here a new problem appears - recall from the theory of The Quantum Luminiferous Aether that the force on an electron (or positron) is zero as it moves through the aether. Hence we would not get any footing to push against. But recall further (again, look into the online paper) that there is a force on the electron from one component of the aether, and it is just that the force from the other component of the aether fully cancels it. So one way to achieve our "aetherial drive" will be to indeed form our electron beam into a gear-tooth distribution, but also form an overlapping positron beam that does not have the gear-tooth shape. That way, the electron gear-tooth would push against (have a footing on) the negative component of the background aether, while the positive component of the background aether is pushed to the side so it does not provide the cancelling force. In this way, a net force is obtainable, and we will be able to both propel and steer our aetherial-spaceship.

We will need our electron and positron shells to fully encase our aetherial-spaceship in order to isolate the aether within the ship from the ambient-aether outside. There may be some concern about what happens to the ambient-aether when our ship passes through it. Perhaps the ambient-aether will have a speed-of-light limit when we try to move it out of the way. In order to overcome such an issue, we may wish to form our encasing shell with needle-nose fore and aft end-regions and then gradually increase the ship width toward its middle. That way, the ambient-aether will part and then smoothly flow around our ship, and we will be able to reduce the ambient-aether speed to as small as we wish simply by reducing the growth angle near the end regions. (And making the ship longer.) A diagram of our ship’s hull is shown in Figure 1.

Figure 1. Diagram of an aetherial spaceship hull showing a shape that will gradually guide the ambient-aether out of the way. (Figure is not to scale.)

Our gear-tooth electron beam and overlapping positron beam that we will use to propel and steer our ship will be in the thick (longitudinally central) regions of the hull. Those driving beams can be made in the form of tank-tracks, with their return path being in the interior of the ship. On the return path we will arrange to flatten out the electron beam gear-teeth so no force will exist between the returning track and the internal aether inside our ship. The remainder of the hull will employ beams that do not need the gear-tooth pattern; they merely need to fully expel the ambient-aether.

Note that the portion of the tank-track in contact with the ambient-aether may be at rest with respect to the ambient as it pushes against it or idles. For the return path of the tank-track the speed-of-light limit no longer applies, since it completely expels the aether inside our ship. Similarly, the speed-of-light limit does not apply to the aether in the remainder of the hull for the same reason. (The speed of light limit results when aether, such as charge, passes through the ambient-aether. By totally repelling the ambient-aether in our shell and tank-track, we no longer flow through the ambient, we instead completely route the ambient out of the way, avoiding the physical cause for the speed-of-light limit.) So we *can* break the speed-of-light limit with our aetherial tank-track, but we haven't yet specified *how* we can do it. At this point in our science fiction world we'll just assume we can, and we'll discuss this point in more detail in section 9 below.

The possibility of breaking the speed-of-light limit allows us to once again dream of the stars. While rockets and starships made of normal matter will need to obey the speed-of-light limit specified by relativity and the Lorentz Force Equation, starships with aetherial hulls and aetherial star-drives will not have that limit. Hence, rather than getting to the nearest star at best in several years, we can again dream of getting there in minutes. The entire galaxy, and more, is now available within reasonable times in our aetherial science fiction world.

6. Aetherial Time-travel. Beyond advances in transportation through space, there is another possibility of aetherial control that may also be extremely important for mankind, and that is the possibility of aetherial time-travel. It is well proven in labs that if you accelerate a beam of unstable particles to nearly the speed of light that they will take longer to decay; in some cases, much longer. This effect, called time dilation, was postulated by Larmor and incorporated into the Lorentz Transformation Equations in the early years of the 20th century. Time dilation is also a feature of Einstein's special relativity, and it is extremely well established scientifically. From an aetherial standpoint, this phenomenon can be understood by a postulate that as something travels through the aether, it also travels forward in time.

So what does it mean to travel forward in time? Consider the possibility that you have a watch on your hand that also records the date. If you were to instantaneously travel forward in time by a minute, your watch will have the same reading both before and after your one minute of time-travel. When you get that one minute into the future your watch will therefore be one minute behind everyone else's watch. (At least those who bother to keep them accurate.) If you travel a year into the future, your watch will be a year behind. Those are discrete travels into the future. If the travel is instead continuous, instead of a sudden jump into the future, your watch will simply "run slow" as viewed by those watching you travel into the future. To you, as you travel into the future, your watch will look normal, and everyone else's watch will look like it is running fast. If you are traveling into the future at a high rate, other people would see you move extremely slowly; an eye blink may take weeks or even months to complete. And from your vantage point, you would

see the sun go past quickly, or even just a flash of light (day) followed by an equally quick dark period (night). Traveling forward in time has no philosophical difficulties with cause and effect (causality), whereas going backward in time cannot be allowed. (You can't go back and kill a grandparent before they conceived your parent if you only go forward in time; going backward in time would allow that impossibility. So we can travel forward, but not back.) And, as said above, from an aetherial standpoint, traveling forward in time is exactly what is happening in the known (experimentally proven) process of "time dilation".

Once it is understood that things travel in time as they travel through the aether, the obvious question is: what will happen if we move the aether instead? Above we have speculated on the formation of aetherial-bubbles for transport, but if instead of moving what is inside them to a new place, what if we simply generate an "aether wind" and blow that wind past the bubble's occupants? Provided we can get that aether wind to a speed close to the speed of light, what will happen is that the occupants should travel to the future at a rate determined by the speed of that aether wind. To arrange for such a system, we would want to make a doughnut shaped pipe and use our magnets to shape moving profiles of electrons and positrons such that the electron and positron shells force the aether inside them to move at great speed. Once done, we would have an aetherial time-travel chamber that will send its inhabitants into the future.

An aetherial time-travel chamber would have great practical benefits for mankind. The first benefit comes in the area of health care. Ambulances could be equipped with aetherial time-travel chambers to quickly get victims to a state of suspended animation while they are transported to the best place to care for them. Rather than having emergency care centers staffed at odd hours with possibly fatigued health care professionals, patients with emergencies could be placed in an aetherial time-travel chamber and sent into the future where the best possible staff could treat them. If something unexpected begins to occur during an operation, they could be sent again to the future when a calm, well thought out decision could be carefully executed, possibly bringing in a different specialist. For people with diseases that have no known cure, they could be sent far into the future to a time when a cure is known.

Elder care is another possibility. Rather than having nursing homes, the elderly could be kept at the homes of their children, who could send their parents into the future when the children need to be away at jobs, possibly having their parents come out just one day a week when they can be given proper care and attention. And people could even possibly be sent to the future to a time when aging itself might be cured.

Aetherial time-travel would also enable great promise in areas other than human health. Species on the verge of extinction could be sent to the future where better knowledge could be used to preserve them. And some mundane examples exist as well: rather than dealing with food spoilage, food stocks could be sent to the future with no "sell by" dates needed; refrigerators would be replaced by aetherial storage units; and rather than waiting in line at amusement parks, you'd just be directed into an aetherial time chamber that will send you into the future until it is your turn.

7. Gravitational Control. So far we've only speculated on moving within aetherial-bubbles or moving an aether wind past us. But the theory described in The Quantum Luminiferous Aether also tells us how gravity comes about. Once we learn more about gravity, controlling gravity

becomes possible. We'll want artificial gravity in our aetherial-spaceships to keep us on the floors, and we may need to counteract any reaction forces with artificial gravity during our accelerations. Also, acceleration control will be needed to determine whether we move along with the moving aether (in our transporters) or if the aether moves past us (in the time-travel devices). With enough knowledge about how gravity arises, such control may eventually be within our reach. And of course, controlling gravity would be extremely beneficial for earthly transport of goods as well.

8. Leaving Science Fiction Behind and Returning to Actual Science. The discussion above is a science fiction story that illustrates the enormous potential that aetherial science may eventually bring to mankind. Toward that end, it was useful to speculate that aetherial bubbles could be formed by proper formation of electron and positron beams. However, it is extremely unlikely we will achieve aetherial control in this way. The keen-eyed reader, who did not willingly suspend their disbelief, may have realized that protons and other atomic nuclei are also positively charged, and hence we could have used proton beams instead of positron beams. And since the overall goal was to achieve both a positive charge density and an overlapping equal negative charge density, why not just use normal everyday matter, as it already has such positive and negative densities in its atomic nuclei and electron shells? Well, we already know that everyday matter does not yield the magic properties discussed above of aetherial transport, star-drive, and time-travel. And so we come to the conclusion that normal matter doesn't allow us to form aetherial bubbles. Furthermore, we also know that electron and positron beams generally react with normal matter by losing their energy through the dE/dx process. So the rational belief is that such beams will not shield a starship from an oncoming asteroid, much less allow penetration through planets as we travel. Additionally, a study of The Quantum Luminiferous Aether shows that the theory is developed assuming small aetherial disturbances. For the disturbances to be small inside of atoms means that the density of the aether would be higher than the density of the electron clouds within the atom. Hence, the needed electron and positron beam densities are very likely well beyond present beam-physics capabilities.

If nature does employ a high density of charge in its aetherial components, the advances speculated about above are still possible, but the technology required to achieve them may be quite different. We may instead need to manufacture solid shells of each type of aether for our bubble boundaries and gear-tooth drive mechanisms. Of course we don't know specifically how that can be done right now either. But we do know that the aether is a solid, and we also know how to knock small chunks of it out. (As mentioned above, the small chunks we knock out are what we call electric charge.) So perhaps we can eventually make the aetherial shells needed for the practical applications not by using beams, but rather by learning how to make or extract aether in its solid form, and control it that way. After all, mankind learned to use iron tools long before we even knew about iron atoms. However, it may turn out that extraction of solid aether from the ambient will prove to be extremely difficult. The present theory is consistent with a solid aether existing even under conditions at the center of super massive stellar objects, where enormous forces are present. If those forces to not tear the aether apart, the problem of mining solid aether will likely be quite difficult. A more feasible approach may be to build it up from individual quanta; and that too would be daunting.

While we may not presently know how to make aetherial bubbles, we do have a direction for future research toward that goal. First it would be valuable to verify the mathematical and logical correctness of the theory described in The Quantum Luminiferous Aether or to find and correct

any flaws. Then we should work to establish and perform experimental tests to learn more. Then we should refine the theory and our testing of it, all the while keeping in mind the goal of achieving the great benefits possible with aetherial control.

9. A Return to Science Fiction: A Refined Star-Drive System. In the science-fiction above we discussed beams of particles, since such beams might be fun to make movies about should anyone wish to do so. But with our appreciation that we'll likely need solid aether for many of our desired applications, we can return to the section 5 speculation of an aetherial spaceship and provide an answer on how a faster-than-light aetherial drive could work. Note that I am calling such a drive "star-drive" instead of "warp-drive" because in an aetherial understanding we won't be warping space; instead we will tunnel through the aether. ("Tunnel-drive" could also be used.)

As a first issue, note that the hull depicted in Figure 1 above will be far easier to envision if it is constructed out of solid aether material than if it is made of beams. We can just form the solid to the desired shape, without concern for how different beam sources would need to be created, steered and overlapped into the proper places. The second issue concerns the gear-tooth drive mechanism. The tank-track speculation of section 5 had the issue of how we could make it move faster than the speed of light. Once we instead consider a solid aether hull, we can replace the tank-track mechanism by deformable pads located on the surface of our hull. Figure 2 shows a profile of such a deformable pad.

Figure 2. Deformable Pad for Faster-Than-Light Aetherial Drive. Red profile indicates the position of the gear-teeth drive at $t = 0$; orange profile at a later time $t = \Delta t$.

To provide a force against the ambient-aether we will want the gear-teeth pattern depicted in Figure 2 to push against the ambient-aether. One way to look at Figure 2 is for the teeth to move horizontally from the red profile to the orange profile over the time Δt, pushing against the ambient as the ship moves to the left. Such a motion may be limited to the speed of light with respect to our spaceship, since we need to affect the drive somehow. But another way to achieve the same profile is if we deform each tooth so that its left portion reduces to zero displacement while we add a right portion to the tooth during the time interval Δt. This alternative drive mechanism means we need to vertically move portions of our pad surface by the height (h) of the tooth during Δt, rather than moving the tooth itself horizontally by $v\Delta t$. (Figure 2 contains rectangles with red sides on the left and orange sides on the right. For each tooth, we move its left rectangle down, and its right rectangle up.) Since we have control over the tooth height and width, it may be possible to have a small enough tooth height such that $h << v\Delta t$ which would allow our deformable drive mechanism to enable spaceship speeds considerably greater than the speed of light. (The physical motion is vertical and less than the speed of light while the profile of the teeth moves horizontally at greater than the speed of light.)

While beams were useful to begin our discussion, it is seen that solid-state hulls and deformable pad drives are a much better design option for our science fiction, faster-than-light, space ship. In

addition to the freedom from electron and positron sources, our hull can be guaranteed to be “air tight”, unlike the situation with beams.

10. Concluding Comments. I hope you enjoyed the above aetherial speculations. As mentioned at the outset, all of the speculations are just that, speculations. Importantly, these speculations and indeed the whole quantum luminiferous aether model are so far the work of a single man. It is expected that contributions by others could significantly advance both the science and the speculations. None of the speculations in this paper have yet been theoretically reviewed, and the idea of the gear-teeth drive mechanism is quite new and it has not even been thoroughly thought through by myself. So it is wise not to take much of this paper too seriously just yet.

Not mentioned in any of the speculations is the role of energy in generating aetherial control, and the energy required could be enormous. The famous equation $E=mc^2$ informs us that the energy associated with moving through space may be very large if we are to move at speeds approaching the speed of light. At this point it is unknown if generating an aether wind will require such large energies or not. The act of having an aetherial bubble push matter to the side as it encounters other objects may also require enormous energy. In the latter case, we'd get the energy back after we are done passing through, but we may have to supply enough energy to get the tunneling going. Since $E=mc^2$ relates to things moving through the aether, it also may not apply to our speculated aetherial applications. We just don’t know at this point.

And beyond the speculations I want to again reiterate the importance of the science. It is in the aetherial science and subsequent aetherial engineering that such breakthroughs as time-travel, teleportation and "star-drive" might be made. To get a start on such science, please study the scientific paper. That paper will allow you to learn more about an alternative to relativity that resurrects the basic concept of a luminiferous aether, but one that takes things far beyond the primitive luminiferous aether of the early 1900's. All of the known laws of electrodynamics and gravity are shown to come about from some simple assumptions about what the aether is made of and how it interacts, and the derivations are rigorous. Several present-day mysteries are dealt with, such as how dark matter comes about. I believe it will be worth your time to read and study more.

I have often been asked two questions about my work in theoretical physics: 1) What practical benefit can there be? and 2) How is the new theory different from the status quo? I have always answered the second question with some specific tests that can be done, and for the present aether work I've pointed out additionally that some existing tests (dark matter, understanding quantum mechanics) are better explained by aetherial science than by the status quo. However, it is in the eventual promise described above that one can more easily see the answers to these two questions. While general relativity did calculate some observable phenomena it did not lead to much if any practical advance for mankind. As discussed above, the potential practical advances enabled by aetherial science may prove to be quite significant.