Light Waves are not Field Waves

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This is by request, to answer questions from a reader. It doesn't cover anything new from me, but it may clarify postulates I have used extensively in previous important papers.

This reader was nice enough to admit that this discovery is one of my most important additions to the history of physics, since before I came along no one had thought to ask if there were different kinds of waves, categorically. According to the mainstream, a wave was a wave was a wave. Or, to say it another way, when you learn wave mechanics, you aren't taught to ask any foundational equations before you start applying them, like what created the wave and how. If you are given a wave, you just slap the equations on them and start calculating. We have seen a similar thing in all subfields of physics, where you spend a lot of time learning a new math, but no time learning how to apply it. If the question comes up at all, it is answered like this: **there is only one way to apply it, which is to feed the equation what it demands**. Fill in the variables or functions and compute. Everything else is philosophy, and physicists are not philosophers. They are mathematicians. They don't ask questions like that.

But of course that isn't how it works. Physicists admit physics is complicated, and neatness counts. If there are distinctions to be made, you have to make them, or your math starts misfiring. Your math can only work if you have the right equation and put the right numbers into it. So if you are glossing over important subtleties, they are no longer subtleties. They may seem like subtleties because they were not obvious and they were overlooked for centuries. But if they affect your calculations, they aren't really subtleties. They are fundamental and crucial. It is absolutely necessary that you know them.

This is one of those "subtleties" that everyone before me liked to rush over, but that I prefer to dwell on and solve, because it changes the math and the solution.

From the beginning, it was just assumed that light was a field wave, analogous to sound. Sound is a field wave because it is composed of many particles in a field, not by the motion of one particle. So when physicists before Newton started working on the problem of light, they never asked the question I finally asked: is the wave of light being caused by a field of particles? They just assumed it was, because what else could it be? In fact, they *assumed* light was a field wave because it seemed even more likely to be caused by a group of particles than sound. Why? Because sound was found to caused by the motion of air molecules, which, though small, are not vanishingly small like particles of light. Even before Newton it was deduced light was made of particles far smaller than air molecules, which has turned out to be correct. But my point is, it had been found that the smaller the particle, the more likely it was to work as a field. Or, to say it another way, the smaller the particle, the more necessary it had been to treat it as a field mathematically. Since you couldn't isolate a single particle, you HAD to treat the phenomenon as a field, no matter what it was. So it is understandable why light was treated as a field from the beginning.

But as so often happens, once you create a math, it takes on a life of its own. These early physicists created a wave mechanics to apply to light that was of course a field mechanics, in which the particle—even if admitted to exist—was only a statistic. Once they did that, this field math—by itself and on its own—suggested and implied that the light wave was a field wave. It was defined by field math, so what else could it be? In this way, the question was buried. No one ever thought to ask if light could create a wave that wasn't a field wave like sound. The question never came up before I arrived; or, if it did, it was immediately buried as unanswerable. It came up after quantum mechanics was born, and questions like that were no longer fashionable. In fact, they were worse than unfashionable, they were *verboten*. By that time such a question was considered to be a pool-ball visualization of the quantum world, and the big dogs like Bohr and Heisenberg had forbidden that sort of artsy-fartsy diagramming. And why had they outlawed it? Because they were utterly incapable of it. They had no visualization skills and no mechanical skills either. So they naturally wished to hang out in the "purest" of pure math, where they could never be inconvenienced by a mechanical or foundational question.

They had to do this because the question had recently reared its head most positively, when light experiments in the late 19th century and early 20th showed light acting in some very "weird" ways. Weird in that light wasn't acting like a field wave. It wasn't acting as expected, since it wasn't acting like a smaller, faster version of water or air. This cold-cocked Bohr and his buddies and it is still cold-cocking everyone in the mainstream to this day.

It was so "weird" it ended up driving them all crazy. Their inability to solve it, or even countenance it, forced them to rewrite or jettison all the old rules of physics and to basically implode their entire field. Individually and as a group they torched themselves on this funereal pyre of light, committing a sort of institutional mass suttee and taking physics down with them. Their descendants in the field, such as they are, are still charred with the madness of their ancestors, so much so they cannot accept the gift of a simple solution, gift-wrapped and delivered to their doors.

Which is precisely what my solution was and is. I showed the answer was simple: the wave of light is not a field wave. It is a SPIN wave, created by each spinning photon. This is why single photons can act like a wave. The wave in the data isn't caused by gaps in between photons, it is caused by the spin of the photon itself.

As strange it may sound, physicists had never asked themselves if one particle could create a wave. All their experience up to that time had been with water and air, where waves were created by fields of particles. So they naturally assumed the light wave would work like that. Even after they discovered pulsars, they didn't realize the pulsar could be thought of as a spin wave created by a single body. They had been missing that realization for centuries already, since Ole Rømer had been using lunar eclipses as clocks since the 1600s. Neither he nor anyone after him recognized that any clock is a wave, and every eclipse of this sort is a spin-clock, since it is based on rotation.

The amazing thing is that even Feynman didn't realize it, though he is in part famous for his shrink-and-turn method, which uses CLOCKS to help solve problems with light. His method works *precisely* because his clocks are acting as spin waves. His method allows you to track where a photon is in its own spin cycle after some amount of time, helping drive around a few of the mysteries of light, including entanglement.

But while Feynman's method was just a limited heuristic method that he treated as little more than a trick—one that the mainstream has since tried very hard to bury—my method is neither a trick nor limited. It is fundamental because I have used the real spin of the real photon to create a new wave mechanics that immediately and permanently dissolves all the old mysteries. In a series of papers over many years, I have shown and proved that the light wave is created by each photon alone, and that it is defined by the radius of the photon scaled up by c^2. We treat each photon as a quickly spinning pulsar, and the wavelength is simply the local period. But since the photon is moving and spinning at c, that local period is stretched out for any external observer. So if you were living on the surface of the photon, you would see the period as x and the radius as r. But since the photon is moving c, in the direction of that motion the radius seems to us to be $8rc^2$. The eight being the factor between circular motion and straight-line motion.

A critic may say my analogy to the pulsar breaks down, because the pulsar is emitting light, while the photon is not. For this to work, the photon would have to be emitting a field, with the field defining the difference we are measuring. In which case we have gone *ad absurdum*.

No. My comparison to the pulsar was *an analogy*, not a perfect equality. I said the photon was *like* a pulsar—in that it created a spin wave; not that it *was* a pulsar. At the level of the photon, we don't have to propose an emitted field (though there may be one), since the fast motion can create the "measurable difference" without it. What I mean is, my critic above is implying that without an emitted field, there is nothing to distinguish the spinning photon from its neighbors, or even from itself at a different time. There is therefore nothing to *express* the wave. But that isn't true regardless, since the motion c expresses the wave without talking of anything else. How? Because the photon radius is stretched in the direction of c and no other direction, with the stretching being the wave expression. My critic will say the photon can't then express the wave except when it is in collision, and my answer is that there is no theoretical need for the photon to express the wave *except* in collision. Have we ever measured the wavelength of light that *wasn't* interacting with us or our machines?

As usual, the mainstream has missed the pretty easy answer by being too narrow, and then when I point it out to them they misdirect by arguing too wide. They miss the distinctions that have been sitting in front of them for centuries, and when someone else finally sees them, they suddenly become masters of hair-splitting, making up distinctions that don't exist.

If my critic is especially clever, he may laugh and say, "touché, however you still lack a difference in the wave that would explain a different expression at different times. I don't see how you are going to get that heterogeneity in your photon without an emitted field". But I have, and again very simply. We don't need an emitted field or even an out-of-round photon. All we need is at least two stacked spins. In my paper on superposition, I showed that mystery was solved by stacked spins, and we have that to work with here as well. In most cases when I am using stacked spins, I am using them to explain the composition of somewhat larger quanta, like mesons or baryons. In that case we can build larger radii, explaining ever larger particles, up to W's and Z's and Higgs. But it is also true at the level of the photon itself, which I have pointed out before requires at least two spins to explain not only superposition, but the spin wave itself. And now you are seeing exactly why.

If we propose a photon with only an axial spin, we have a sort of potential wave created by the stretched-out radius and the spin, but no real way to express it (see it) from our level. Locally, a person camped on the surface of the photon might see it by watching for an object in his sky to re-appear. Or, if we could look on the surface of the photon with a microscope, we might track a little mountain there, noting its periodic re-appearance. But without that, we have no way of knowing where in its own wave the photon is, and would have no way to know even if the photon collided with us. The collision would be no different at time x than time y, so the wave could not be expressed. But if the photon is two waves stacked, the problem is solved, since in that case the photon acts differently at different times in its spin cycle. In one part of the larger cycle it is moving forward relative to c, and in one part it is moving back. So we have that heterogeneity my critic was talking about, you see.