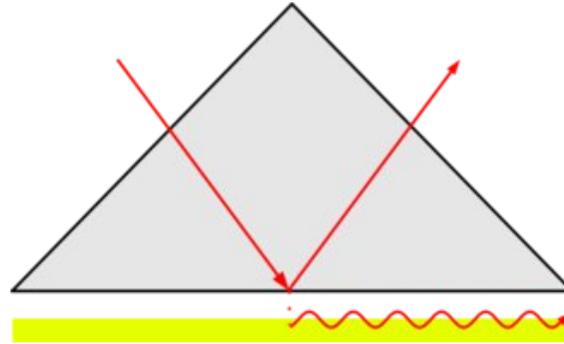


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SURFACE PLASMON RESONANCE



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As with other examples of solid state physics—which I call fudge state physics—the explanation of this phenomenon is a mess. At the fundamental level, it relies on the old [Drude-Sommerfeld model](#)—which I have destroyed there—so we already know it can't be right. We also know that immediately due to the fake entities created: **plasmon** and **polariton**. At a glance, those terms would seem to apply to particles, since they end in “on” like photon and proton. But they aren't particles. The mainstream admits they are traveling EM waves. Meaning, they are just field characteristics or outcomes, and can't possibly explain anything as a matter of theory. To say it another way, they are *results*. Giving these field results particle names can only be perverse, since it implies a physical solution when there isn't one.

But it is more than that, because we see a theoretical mismatch between the plasmon here and in other places. In SPR theory, they tell us a plasmon is an EM wave, or more precisely an electron density wave. But if we [search on plasmon separately](#), we are told it is the quantum of plasma oscillation. What does that mean? Basically nothing. It is more QM gobbledygook, since it is followed by this:

Just as light (an optical oscillation) consists of photons, the plasma oscillation consists of plasmons. The plasmon can be considered as a quasiparticle since it arises from the quantization of plasma oscillations, just like phonons are quantizations of mechanical vibrations. Thus, plasmons are collective (a discrete number) oscillations of the free electron gas density. For example, at optical frequencies, plasmons can couple with a photon to create another quasiparticle called a plasmon polariton.

Just awful. That isn't physics by any stretch of the imagination. Does anyone honestly think it is? According to that explanation, a plasmon is **neither** a particle nor a wave; and since it is a quasiparticle, that means *it doesn't even exist in real space*. It exists only in these crack-brained theories and models, and in the fuzzy minds of physicists who think “light is an optical oscillation”—or who try to make *you* think that it is. I have news for them: **Light isn't an optical oscillation**. The photon is absolutely *not* the quantization of optical oscillations. The photon is a real particle with real

characteristics (including real spin) that exists in real space, so it is not an analog of either the plasmon or the polariton. But everyone knows this, so I don't know why I have to be the one saying it.

Notice, for instance, that they admit a plasmon is a collective. The photon is not a collective. It is a discrete particle, and that has been proved in experiments back to the photoelectric effect more than a century ago. Also notice that they say a plasmon can couple with a photon. How exactly does a quasi-collective couple to a real particle? And I mean physically, not mathematically. How does a fake particle couple to a real one? It can't, can it? So we know something else is going on here.

But the word plasmon is fuzzy and misleading in yet another way. They tell us the plasmon is the quantum of plasma oscillation, but that would work only if every charge field was a plasma. But strictly it isn't. A plasma is defined as a gas of ions and free electrons, so an SPR isn't really a plasma. Plasmas are normally thought to be created by strong EM fields, and are very hot. That isn't the case here. All we have are meeting charge fields, at fairly low temperatures. The light in SPR is not powerful enough to strip a large number of electrons from the gold, though it may strip a few. The free electrons in this phenomenon were already present, and calling this a plasma is a stretch. So calling anything a plasmon here is pretty heavy misdirection. It is the attempt to bury this problem under esoteric new words and fields, when none of that is necessary.

They also can't seem to decide if the plasmon is a collection of electron oscillations or photon oscillations. Is it an "electron density wave" or "the quantum of plasma oscillation"? If the plasmon is an analog of the *photon*, then it can't also be the *electron* density wave. You see how much fudge there is here already.

Now, I will nod to the mainstream here, since they have compiled a lot of good data and have learned to manipulate this phenomenon technically in many ways. They have most of the pieces in hand, so that it is very easy for someone like me to come along after the fact and put it in order. Their major problem was a misunderstanding of light and the charge field, which they inherited from more than a century of misunderstandings, all the way back to Maxwell. Therefore, I could easily forgive them their confusion. . . if it weren't for the fact that they are so pig-headed. They have these horrible theories, which they *know* are horrible—any honest person must be aware of that—and yet when a better theory comes along they lock down and refuse to budge. Rather than welcome me to the fold, they have decided to try to slander and bury me, only because I arrived from the margins. I started solving their problems for them more than 20 years ago, but from the beginning they have ignored me or treated me with undisguised contempt. My sin: I hadn't come up through the ranks and therefore didn't have a sponsor. I hadn't obeyed all the posted rules. I hadn't paid the requisite fees and bowed to the proper idols. In other words, it had nothing to do with science and everything to do with clubs.

Anyway, I will once again solve this one for them for free, they can steal it from me and continue to pretend I don't exist, and we will go on as before.

There are no plasmons or polaritons here, so the first thing to do is jettison both words as a nuisance. All you need to solve this, as usual, are spinning photons. That is, REAL photons with real radius and real spin. Also with real mass and real momentum. Seems pretty obvious, but the mainstream can't go there because it would destroy many Nobel Prizes and collapse the entire standard model. Quantum physics can't deal with a real photon with real characteristics, since it would destroy all their manufactured matrices and fake operators. So they are forced to hide out in undefined plasmons and polaritons. Fake particles are far easier to fit to fake matrices, you see, since the fact that they are undefined makes them far more malleable. They can mimic a photon one minute and an electron the

next, and few will notice. The trick is to keep everyone's eyes on the math and off the mechanics.

All we really have here is a charge field border. We have the charge field of a solid meeting the charge field of a gas (or sometimes liquid). Which means we have a more dense field of real spinning photons meeting a less dense field of real spinning photons. Under *normal* circumstances, that may create a narrow EM field at that border, of up to one infrared wavelength. Why? Because photons or *free* electrons at that border will interact. They will bump, transferring spin energy by direct contact. So why such a narrow EM band? Because EM requires wave coherence, and although the solid provides that, the air or liquid doesn't. Depending on the solid and gas used, there may be almost no field created, and that is because it dissipates almost immediately. The coherence dissipates. But some combinations can create a measurable field, even without total internal reflection (TIR) or SPR.

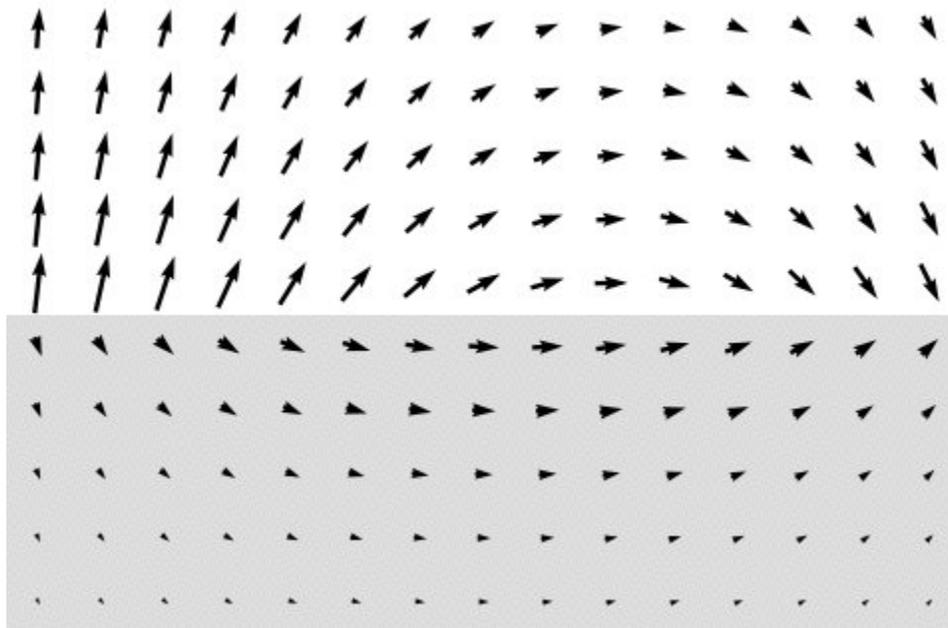
But if we now manipulate that border, by first creating TIR with coherent light, then by adding a film of gold at the border, we can create some interesting and measurable effects there. The light further energizes the border, and the TIR creates just the right angle, so that the spin energy of the internal photons matches that of the external field. In short, the angle decreases the effective energy at the border of the internal photons, just as a glancing blow has less energy than a direct one. The internal photons don't have enough energy to escape, and they are held inside by the external charge field.

You will say that doesn't seem possible, but it is, because 1) the reflected light is low energy, 2) the ambient (external) field is much stronger than physicists currently suppose. This phenomenon couldn't work in a vacuum or tenuous atmosphere, and the fact that it does work is proof of the strength of the atmosphere here on Earth. The atmosphere here is not only quite dense, it is very electronic. Rich in electrons and other ions. It is fully able to reflect light in a large number of situations, as we know from normal atmospheric phenomena. In short, it is a powerful medium, though the fact that we can't see it often fools us into thinking it isn't there or isn't doing much. We don't need plasmons or polaritons here, you see, because we already have a real and powerful charge field, and that charge field has real characteristics. To say it another way, the air around you right now is not only stiff with free ions, it is even stiffer with heavy charge. [Roughly, the charge around you outweighs \(as a function of energy equivalence\) the matter around you 19 to 1.](#) This charge is the missing dark matter, and isn't just missing in the universe or in distant parts of the galaxy. It is missing every time a physicist tries to solve a problem like this on the Earth. The real charge field is left out of all mainstream equations and theories, near and far, quantum and macro.

It is also worth pointing out that the ambient charge field on the Earth is already semi-coherent, before we do anything to it. The Earth itself is cohering it. The atmospheric charge field has a strong coherence vertically, since it is being emitted by the Earth straight up. It is also cohered by light coming down from the Sun, Moon, and planets. This incoming light is channeled by the atmosphere, and matched to the charge field coming up. So in any possible lab, this coherence will exist. The mainstream always forgets that.

We know that SPR is an outcome of real spin, though the mainstream likes to ignore that. We know because SPPs are always transverse magnetic waves, and *they cannot be created by S-polarized light*. In that case, the internal photons are spinning in the wrong plane, which causes them to spin up the free electrons in the wrong plane, and we have no spin interaction with the external field. That by itself proves this is caused by real spins on real particles, and cannot be a virtual or field interaction. This can only be explained by real particles hitting real particles, and transferring spin energy by direct contact. But since the mainstream gave up trying to do that back with Maxwell, they cannot possibly offer the correct answer here. They can only misdirect.

We also know it from [the animations](#) at Wikipedia:



That is a gif, though I don't know if it will move for you. If it doesn't, take the last link above and watch it. Every arrow below is spinning clockwise at the same rate, and every arrow above is spinning counter-clockwise. The arrows are also synched, so that a wave is creating moving from left to right along the border. It is a wonderful animation (created by [Sbyrnes321](#)), though it is somewhat surprising they publish it. All they have to do is assign each arrow to a real photon or electron, and the thing is solved. This is an interaction of spinning particles. But they expressly refuse to do that, and I have already told you why. If they assign those arrows to real particles, the standard model would collapse. All their operators would implode, and all the famous “math” of the past century would be swept out the door as garbage.

The directions of spin are telling as well, since we notice they are opposite. The ones below are CW and the ones above are CCW. Why? Is it some esoteric difference? No. Is it because solids and gasses have opposite charge spins? No. Do we have antiphotons involved here? No. It is simply because the photons below are moving *up* toward the border, while the photons above are moving *down*. The same spinning particle moving in the opposite direction will naturally have an opposite spin. So we don't need antiphotons here. These are all photons from the same field, just moving in opposite directions.

So although our animator has the basic ideas right here, he hasn't published a complete animation. He has simplified it, which is fine. If we diagrammed the real photons, we would also have to include the fact that the photons above are moving down while the ones below are moving up. Since we have TIR and an equalization of energy at that border, it doesn't really matter: the secondary wave at the border will be moving straight right, not up or down. It will hug the surface.

Notice I said *secondary* wave. This is a secondary wave, because every photon in the field creates a

wave, due to its spin. A spin wave. The wavelength of light is just the [local spin of the photon scaled](#) up by $8c^2$ due to the speed of the particle. The spin is transverse to the direction of motion, so the apparent radius of the photon is stretched out along that line, increasing its wavelength by a huge amount. But, as you can see in the animation above, the EM field wave is nothing like that. It isn't a spin wave, it is a field wave, caused by a wave in a large field of particles. It is like a water wave. The wave motion of light is nothing like water, since it isn't a field wave.

[At sprpages.nl](#), we read this:

Although no light is coming out of the prism in TIR, the electrical field of the photons extends about a quarter of a wavelength beyond the reflecting surface.

That has confused some, because if the EM field is a function of charge, but no photons are passing the border, what is creating the EM field? It has to be photons, but no photons are there. Well, the photons in the reflected light aren't there, but other photons are: charge field photons. Charge field photons are everywhere, so we have charge fields top and bottom, pre-existing all experiments. It is moving patterns in those photon fields (and ion fields) that we are reading as EM waves. That is all EM has ever been: bulk patterns in the charge field, as in the animation above. So, once again, we have no need for plasmons.

At the same place, we also read this:

When the electrical field energy of the photon is just right, it can interact with the free electron constellations in the gold surface. These are the outer shell and conduction-band electrons. The incident light photons are absorbed and the energy is transferred to the electrons, which convert into surface plasmons.

Contradictory again, since the outer shell electrons are not free. And false, since no electrons are orbiting the nucleus to start with. There are no shells of any kind, [as I prove here](#). The mainstream has never had any indication there are, and tons of indication there aren't, starting with the fact that the theory is upside down to its own definitions. Yes, photons interact with free electrons, but not via absorption or emission. Electrons recycle photons just like protons and nuclei do, though less so. In other words, the electrons *channel* the photons, and in some situations cohere them. To be more specific, the spinning electrons create a vortex at each pole, which pulls in the photons. The photon is then emitted at the equator of the electron. The electron may also have through charge (pole to pole), but that is a different paper.

You may also wish to key on their claim that the absorption of a photon turns an electron into a plasmon. Not only is there absolutely no evidence for that, it is contradicted in many other experiments, where electrons absorb or emit photons without becoming plasmons of any sort. In fact, electrons can and do recycle thousands of photons, while remaining electrons all the while. It would be like claiming that a proton that recycled a photon transformed into a plasmoid body of some sort, or that a nucleus that absorbed a photon changed into some other quantized, quasi, oscillating beast. Everything in Nature is recycling photons all the time, and that process does not transform anything. And of course real particles like electrons cannot convert into pretend particles like plasmons. There is no possible conversion from reality to fantasy. A real physical object cannot convert into a mathematical object, just to suit daffy modern theorists.

This is also rich:

Photon and electron behaviour can only be described when they have both wave and particle properties.

That's true in a sense, as I have shown. They both have to be real particles with real radii and spins. Except that. . . the mainstream doesn't let them do that. These plasmon theories are the attempt to dodge that requirement, since in modern theory, the characteristics of the photon and electron aren't real. They are mathematical only. The photon is given no real mass or radius, so it can't have a real spin. Without that, it cannot create a real wave except by fiat or magic. So in mainstream theory, photons and electrons have NEITHER wave nor particle properties. If photons had any real properties, the mainstream wouldn't have to keep creating phonons, plasmons, polaritons, and a zoo of other quasi-particles to fill the gap.

So you see why I keep calling modern theory perverse. They know electrons and photons exist, but in order to protect old math they refuse to give those particles real characteristics. The old equations are so fouled up by decades of blunders, they can't make that work (without throwing out the old equations and starting over, as I have). So instead they create a new zoo of fake quasi-particles—which they know *don't* exist—hence the word quasi—and then bash those around in tinkertoy matrices, making an ever larger mess. With enough bashing, they can make the matrices resolve, but as you can see that still leaves the theory, which is a monstrosity of contradictions and impossibilities. Even at the definitional level, it is just a compendium of pushes. They don't even bother to follow the dictionary anymore, or stick to the meaning of words. Words—if they mean anything—mean one thing in one sentence and another thing in the next. That is a true measure of the mania of modern physics.

Here is another example from sprpages.nl:

Like all conversions, the photon to plasmon transformation must conserve both momentum and energy in the process.

That would be true except for one thing: you can't conserve energy between reality and fantasy. There is no law of conservation between real particles and manufactured math. Conservation laws only apply in mechanics, since energy and momentum are quantities of real matter. So the moment you start talking about quasi-particles, all conservation laws are out the window. Quasi-particles were created specifically to fudge equations, and if you are allowing yourself to fudge equations, conservation laws are beside the point. All laws are. So talking about conservation of energy in a photon to plasmon conversion is a bald contradiction in terms. It is nothing more than gibberish.

The next section on that page is about the evanescent wave, but I have already destroyed that theory [here](#). In that paper I have already hit much of what I am hitting here, and some things I will not here, so it is worth your time regardless.

So is anything really “coupling” here? It depends what you mean by coupling. I don't like the word and would prefer to lose it, since it is foggy. What they mean is that, given the right angle and the right substances, a resonance between the internal charge field and the external is created. That traveling wave is created on the surface. But the two fields were always coupling. In other words, they were always interacting. How could they not? But previously they weren't interacting with any appreciable coherence, so a detectable and usable current wasn't created. That's all that coupling is. And the two fields don't interact via absorption of photons by electrons, or by the creation of plasmons. They react via real spin mechanics, expressed by the meeting edge-to-edge of real particles: photons, electrons, and nucleons. As we saw in my evanescent wave paper, photons are either channeled through electrons or nucleons, or they have to move through real gaps between them. At the wrong angles, they can do

neither, and they are reflected, bouncing off the nucleus or the electron equator by the rules of poolball mechanics.

Yes, all of this can be explained and modeled with classical mechanics, but only with a real channeled charge field and [a correct diagram of the nucleus](#). Since the mainstream has never had anything like that, it could not hope to model any of these complex interactions.

At Wiki, we find this:

In order for the terms that describe the electronic [surface plasmon](#) to exist, the real part of the dielectric constant of the conductor must be negative and its magnitude must be greater than that of the dielectric. This condition is met in the infrared-visible wavelength region for air/metal and water/metal interfaces (where the real dielectric constant of a metal is negative and that of air or water is positive).

But that isn't why this happens in the near infrared. It has nothing to do with any dielectric constant being negative, as I show in [my paper on the dielectric](#). It has to do with the charge field existing in that region to start with. The charge field here on Earth pre-exists in that region, no matter what your experiment is. Because the energies in SPR are low, the charge field isn't spun up much. It may be spun up to low visible, but that is about it. But this is a big clue here, since it shows us the mainstream doesn't even know that. If it doesn't know the normal energy of the charge field, it can't possibly create any theory to contain this other data. Remember, I didn't get the energy of the ambient charge field from experiment, [I calculated it](#), straight from the known values of G and the Dalton.

This is also amusing:

In order to excite surface plasmon polaritons in a resonant manner, one can use electron bombardment or incident [light beam](#) (visible and infrared are typical). The incoming beam has to match its [momentum](#) to that of the plasmon.

See a little problem there? I thought the incoming beam was *causing* the plasmon, so how can it match its momentum to something that isn't there until the light creates it? This just proves that the resonance is already on any border, caused by the meeting of charge field densities, and that the incident light is only boosting it and cohering it. What they should say is that incoming light needs to match itself to the charge streams in the gold or other substance, since it is channeling through it. Remember, the light isn't just traveling through the gold, as in traveling between nuclei. It is traveling *through* the nuclei, in defined charge streams. The gold nucleus defines the charge and light streams, and it will create different external energies than other elements. So when the mainstream gives us a list of things that determine this effect, they forget to mention the substances in question, not only the gold but the composition of the air. As you now see, you can't treat these substances as homogeneous fields, like Fermi gasses or something. You have to consider what nuclei are actually there. But since the mainstream hasn't diagrammed the nucleus, it can't do that, so it tries to solve without that. It can't be done.

And why are the SPPs shorter in wavelength than the incident light? Amazingly, it appears the mainstream doesn't know. It is simply due to the angle of incidence. The angle causes the incoming light to be squashed against that border, giving us only the cosine of its total energy. So when the EM field wave is created, it can express only a fraction of the original wave. You will say that we find a higher local field intensity due to that shorter wavelength, but that isn't why we find higher intensity.

Despite a shorter wavelength and therefore a higher density of crests, the energy and intensity would actually drop. . . except for one thing. This field isn't being created from one direction only. It is being created by the meeting of two fields, as in the animation above. So although the wavelength is created in the way I just said, the intensity is a function of total energy per area. In other words, collisions per area, or an *integration* of two densities.

In current theory, density is an automatic and sometimes straight function of wavelength, since the mainstream thinks the wavelength of light has something to do with particle separations. It thinks photons are separated by wavelengths, or multiples of wavelengths, or something like that. But they aren't. Yes, in the simplest case, photons can't exist closer than a wavelength apart, because locally the wavelength is a photon radius, and one photon can't be inside the radius of another, by definition. But other than that, collision densities don't have much to do with wavelength. They have to do with angles, speeds of particles (like electrons, which can vary), and elements present. Some elements channel faster than others, for obvious reasons. Larger elements and elements with stronger carousel levels have slower channeling times. Intensities at borders will be functions of all those things, not just incident light wavelength.

So, as usual, mainstream theory is both too complex and too naive. As a matter of math and terminology, it is almost always a jumble of unnecessary confusion, but as a matter of basic theory, it is almost always missing many degrees of freedom. We have seen this in every problem we have solved.