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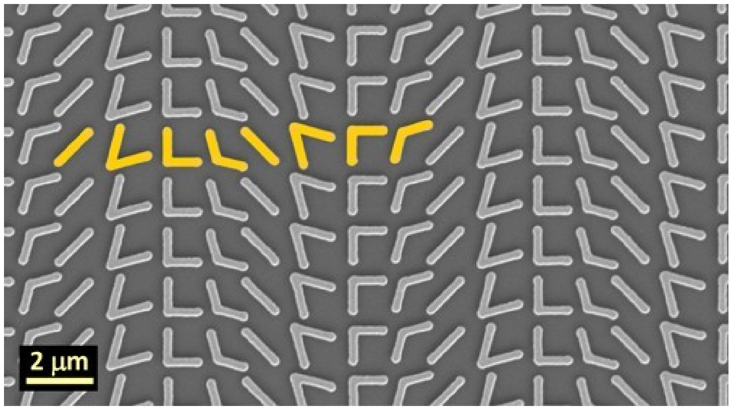
THE LAWS OF REFRACTION

a refutation of the new SEAS experiment



by Miles Mathis

A kind reader recently sent me a link to a new experiment* that claims to overthrow the laws of refraction. As published this week [September 2011] in *Science* magazine, experimenters at SEAS, Harvard, have created "designer" surfaces of nanogold that act to divert light in ways unpredicted by current and historical optics. Because the surface is much thinner than the wavelength of the impinging light, it should act as a boundary only. To say it another way, there is no way to apply the old equations to a layer that thin. It is not clear how a layer that thin could physically interact with the light, since it should act as a two-dimensional surface (rather than a three-dimensional area). As the linked paper puts it:

The resulting phenomenon breaks the old rules, creating beams of light that reflect and refract in arbitrary ways, depending on the surface pattern.

Of course we know that can't be right. Physics doesn't work in "arbitrary ways." What they should say is that the experiment can't be explained with current theory or equations. "Unexplainable" and "arbitrary" are not the same thing. In fact, I will show that the outcomes here are easily explainable with my own theory and equations, presented in my rainbow papers, among other places. To see how my new theory betters the old theory, we will start by studying the old.

In order to generalize the textbook laws of reflection and refraction, the Harvard researchers added a new term to the equations, representing the gradient of phase shifts imparted at the boundary. Importantly, in the absence of a surface gradient, the new laws reduce to the well-known ones.

These physicists have corrected the old equations by adding one new term, said to represent the gradient of phase shifts. But is that really the case? No. The one new term can also be thought of as a hole filler. As a piece of math, it is simply a fudge. It corrects the old equation, and nothing more. The physicists then assign the filler a name, "the gradient of phase shifts." But unless they show us the full mechanics of the old and new math, we have no way of knowing whether the filler is equivalent to the gradient or not. Unfortunately, both the old and the new math are mechanically bare and unassigned. The math matches some experiment, and that has been its only selling point for about three centuries. But of course the old math didn't match *all* experiment, or it would have matched this experiment. And this new math is only known to match this one new experiment. Will it explain even newer ones? No way to know, but I expect not. Since the math is *ad hoc*, it is unlikely to be correct generally. Regardless, the researchers have not really "generalized" the textbook laws of reflection and refraction, they have just forced them to fit this one experiment by adding one term. The researchers even admit this, in their own way:

By incorporating a gradient of phase discontinuities across the interface, the laws of reflection and refraction become designer laws, and a panoply of new phenomena appear," says Zeno Gaburro.

"Designer laws"? What is a designer law? Apparently he means it is a law that morphs to fit each situation. Hmmm. I think Mr. Gaburro may need to look up the definition of "law" in the dictionary.

To see more clearly what I mean, consider how the researchers find the new term. What they do is measure the actual refraction, right from the experiment. Then they work backwards, finding the gap between experiment and classical prediction. Then this gap is simply assigned to the new term. The new term doesn't match the gap because the math is correct. The new term matches the gap because it was *chosen* to match the gap. The researchers tell us the gradient caused the new term. But if we ask for proof, they show us the experimental gap. Circular.

This is what all new physics has become: fudge. No one ever corrects an old equation or old theory, they just take the old equation as true, and jerry-rig some extension onto it. See my paper on Lorentz violations for the ultimate example of this. This procedure allows them to keep up the illusion that they were right before. Newton didn't make a mistake, he just didn't know about nano-technology. If we are to believe the current propaganda, no one in the main line of physics has made a mistake, back to Descartes. The standard model is error-free, bulletproof, and pure to the millionth decimal.

We see that again here. "Importantly, in the absence of a surface gradient, the new laws reduce to the well-known ones." So, despite what we are told in the title about old laws being overthrown by exciting new technology, no old laws are actually overthrown. The new "designer laws" are just extensions of the old laws. This allows physics to rewrite the old laws without admitting that they had been wrong for centuries. This would be like Copernicus saying that Ptolemy wasn't really wrong. Copernicus: "The Earth orbiting the Sun is just a variation of the Sun orbiting the Earth, so the correction is really just an extension. Mathematically, it is just one term in the equation: instead of x, we have 1/x. And if we remove that term, the new laws reduce to the old laws."

The new math has a further glaring problem: it doesn't address the researchers' own questions in this paper at Harvard and *Science*. Because the surface is so much smaller than the wavelength, it isn't clear how the surface interacts with the wavelength physically, as I reminded you above. Well, diverting you into terms that stand for the gradient of phase shifts doesn't address that problem, does it? They tell us that the photons are absorbed and then re-emitted by the gold antennae, or are "trapped by nano-resonators." But how does that work, exactly? If the wavelengths are too large to be affected by the nano-surface, the individual photons should be too small. Yes, the occasional photon might be absorbed by a gold atom or an electron, but will they all? If so, why so? Individual photons are known to be able to travel through dense matter for short distances, and these gold antennae are not densely spaced. Besides, it is the wavelength that is being altered in the process of refraction, right? Refraction applies to wavelengths, not to individual photons, according to the standard theory. How does a trapping and untrapping of photons by nano-resonators affect their wavelengths?

Current theory has no answer to this, and neither do these researchers. But I do. I have shown the connection between the photon and the wavelength where no one else has. As I have shown, the individual photon has a local wavelength, determined by its real radius. The wavelength of light we see is not a field wave, it is the stretched out wave of the photons themselves. This is how an individual photon can carry a wave, as in the two-slit experiment. The wavelength is a physical characteristic *of each photon*. The famous term c^2 is not an accidental term, it is a simple transform. It takes us from the local wavelength of the photon to the wavelength we measure. The local wavelength (the radius of rotation) is stretched out by the motion of the photon, and since the photon is spinning at c and moving linearly at c, we have to multiply by c^2. It is that simple.

That explains this experiment in an equally direct manner, because we can now see how the surface interacts with the wavelength. The nano-surface is not too small to interact with the wavelength of the light, since it is interacting with the local wavelength, not the stretched out wavelength that we see. To get the local wavelength, we have to divide by c^2, which takes us back *below* the nano-field.

You will say, “That only explains half of it. What about your second problem, where you ask how the surface can interact with photons?” To explain that, we have to remember that the layer that includes the gold antennae is emitting a different charge field than the layers on either side. It doesn't matter how thin it is, if it is made up of different elements, it is going to have a different charge field. All the baryons and electrons in that layer are recycling charge photons, so the charge field in that layer will have its own particular spin and direction. In this way, we see that it is not photons being absorbed by gold or silicon that causes the refraction, nor is it photons being trapped by nano-resonators. It is photons being physically deflected by other photons already present in the charge field. And since the charge field is better equipped to deflect than the matter field, our question is answered. I remind you that the classical E/M equations (by classical I mean Maxwell, here) have always contained the following important information: *the charge field outweighs the matter field by 19 times.* And that applies in normal situations, not just esoteric or “dark matter” situations. There is no dark matter, there is only charge: charge is 95% of everything. Again:

$e = 1.602 \times 10^{-19}$ C

$1\text{C} = 2 \times 10^{-7}$ kg/s

$e = 3.204 \times 10^{-26}$ kg/s

Those are currently accepted equations of longstanding. I did not make them up. All you have to do is divide that last number by the mass of the proton, to get 19. To create what we call charge, the proton must be emitting 19 times its own mass every second. Why is physics hiding that from you? And why does no one every remember it when it comes to solving problems like this?

So, the photons in the incoming light don't have to collide or be absorbed or be trapped by the matter in the surface. They are interacting mainly with other photons. And these other (charge) photons are about 19 times more likely to collide with the incoming photons than the nanogold was. Gold has a high mass, but charge has an even *higher* mass equivalence, taken over the given area.

You will say, “Then shouldn't some photons still get through, unaffected?” Yes, they should and they do. In real instances of refraction, we do not see total refraction except in very specific cases. Normally we see partial refraction (refraction of part of the total incoming light). To get total or near total refraction we need a certain density, a certain width, or a coherence of the incoming light. This is already known.

*http://www.seas.harvard.edu/news-events/press-releases/from-a-flat-mirror-designer-light