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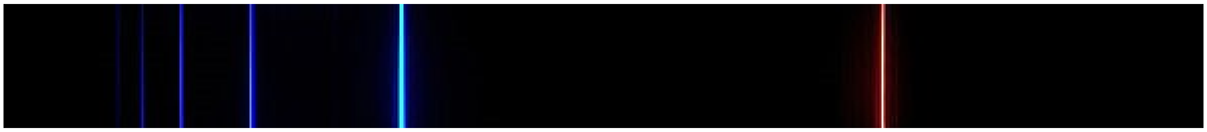
Rewriting the Rydberg Formula



by Miles Mathis

In my last paper I proved that the derivations for the Bohr radius, the Bohr quantization condition, the angular momentum of the electron, and the ground state energy were horribly pushed. This means that the derivation for the Rydberg equation must also fall, since it begins by assuming the validity of the Bohr equations. This left us with little to go on but data. However, I concluded that paper by deriving a new unified field equation for the ground state energy of the electron, an equation that included the gravity field of the proton. I also showed why and how the electron maintains a sort of orbit without losing energy. This means that we have the field and the beginnings of new equations. Unlike the old equations, my equations are grounded in mechanics and transparent math. They are simple and direct, and will remain so as I proceed.

But before I go on, I want to show the current fudge one more time, just to drive the point home. Now that I have uncovered it, I continue to find it shocking, and it doesn't get less shocking as the days and years pass. I say years, because I first pulled apart these equations several years ago, in my first paper on Bohr. I have continued to find more fudges in the proof, and my last paper listed almost a dozen. But these first ones may still be the most brazen. The derivations vary, but many textbooks start the proof like this: Let

$mv^2/r = ke^2/r^2$

The left side is the gravitational centripetal force (if the electron had one, like a planet). The right side is just Coulomb's equation. This first equation is simply stiff with field assumptions, and all of them have turned out to be false. To start with, that velocity variable on the left side comes from $a = v^2/r$. Therefore the velocity is an orbital velocity. It curves. But because that mv^2 looks like the $½mv^2$ from the kinetic energy equation, physicists have freely substituted between the equations. I have shown that is disallowed, because the v in the kinetic energy equations is linear. It doesn't curve. The two variables aren't equivalent. Most physicists think that Newton proved the two were the same, but he didn't. He went to the limit to derive an orbital velocity *from* a tangential velocity, but he never showed their equality. I have gone back to the *Principia* itself to show this, in great detail. If the tangential velocity *was* the orbital velocity, Newton's proof would have been circular. He gives himself the tangential velocity to start with. Why would you bother to derive something you are given? That mistake concerning v was my first discovery about Bohr.

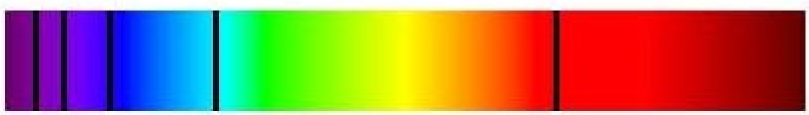
Then I pulled apart Coulomb's equation, and discovered that the right side of this equation above is just as flawed as the left side. To start with, physicists applied Coulomb's equation here without much thought. Coulomb's equation historically applied to static charges at the macro-level (in his pith balls), not to orbiting fundamental charges. Will orbiting charges act like static charges? We have never seen any proof of it, and most people would assume not. And quantum mechanics was not proof of it either.

I have shown that these derivations were pushed to match data from the first line, so they are not proof that orbiting charges act like static charges.

That is always the argument: QED matches data incredibly well, so the initial assumptions have been proven right. No. QED matches data because the equations have been fudged incredibly thoroughly to match data. Physicists have been working day and night for decades to fudge these equations, so we should not be surprised they match data. That was the goal. So the match to data is proof of nothing. Feynman finally admitted that about renormalization, but it turns out it is true about everything, all the way back to Bohr. The Bohr equations are just as dirty as renormalization.

Another assumption was that the electron and proton have equal charges. We have never seen any proof of that, and we have seen lots of proof against it, but because we don't want to have to rewrite these old equations, all evidence is ignored. Again, QED is taken as proof of it, but fudged equations are proof of nothing. It turns out that the electron only has about 1/1821 the charge of the proton, which explains a lot of things—as I show again at the end of this paper, among other places.

And there is another big problem with the right side of the equation. Physicists just applied Coulomb's equation to the quantum level with no understanding of what the equation was telling them. Coulomb's equation works at our level, not at the quantum level. The constant k is a scaling constant, and you don't need it at the quantum level. That one mistake is at the heart of the vacuum catastrophe, since it alone causes a force error of around 22 orders of magnitude. That's right, this equation here is not just pushed a fraction, it is wrong by miles.



But let us move on to the Balmer series. In the beginning, these equations were pushed mainly to explain and match the Balmer series absorption lines for hydrogen.

The Balmer equation is

$\lambda = B[m^2/(m^2 - 4)]$

where $m>2$, and $B=3.6456 \times 10^{-7}$m

Ridculously simple, sort of like the Bode equation. Unfortunately, like the Bode equation, this Balmer equation is totally opaque regarding physics. It is in the wrong form, so we can't see any of the mechanics in the field. Why the number 4? Where is that coming from? Why square the level? Why is B the number it is?

I can explain the value of the constant immediately, since if we divide it by $8c^2$, we find the radius of the charge photon. The wavelength of light we measure is just the local wavelength of the photon times $8c^2$. The local wavelength of the photon is its radius, since it is the local spin that is causing the wavelength physically. The photon's real motion (linear + angular) then stretches out the spin radius, giving us the length we measure.

But what of the rest of the equation? Current theory is correct in some ways, since it explains these lines by an "excited electron." That is true, but what is exciting it? It isn't just a stray photon that is exciting the electron, causing it to orbit at a higher energy. It is a greater ambient charge field that is doing that. The charge field is millions of photons bombarding the electron. The photon is 31 million times smaller than the electron, and although its energy is great because of its speed, one photon isn't enough to knock an electron into a higher orbit *and keep it there*. Once the electron is up there, it requires a continuous bombardment to stay there. The ambient charge has to remain excited, or the electron will immediately fall back down to the level of the charge. You see charge isn't just on the proton and electron. Charge applies to the entire field. The entire field is charged, not just the larger particles in the field. The entire field is full of charge photons.

That is the mechanics, but what of the math? Why this equation and not some other? Well, again, current theory is partly correct, since it is a quantum theory. Quantum theory just means the charge photons will push the electron some amounts and not others. We don't have a continuous series of allowed orbital energies. But current theory doesn't tell you why. I already have in many other papers. These energy transfers are quantized because the quanta are spinning, both the photons and the electrons. And I mean real spins with real radii. The energy is quantized because the allowed spins are quantized. Each particle, including the photon, stacks spins. Once a point on the surface of the spin is going c (tangential), it can't go any faster. If the particle needs to take on more energy—from more collisions—it can only do so by stacking another spin on top of the first. It does this via gyroscopic rules: going beyond the spin radius of the first spin. Therefore, the allowed spin radii double each time. If we have an axial spin of radius 1, then the x spin is 2 and the y spin is 4 and the z spin is 8. At that point, the particle can continue to stack spins by starting another level of a, x, y, z.

That is the mechanical or physical cause of quantization. Exclusion of spin levels. Now, if we apply that to this Balmer series problem, we see that the electron can only increase its energy by interacting with real photons. But the electron and photon can only exchange energy via these spins. Since the spins are quantized, the energy transfer must be as well. We don't excite the charge field just by adding more charge photons, we excite the field by stacking another spin on the charge photon. We do add more photons, but because we have more photons we have more photon/photon collisions, and therefore more spin augmentation. So if each photon's ground-state spin radius is 5×10^{-25}m in this problem, its first excited state will be 1×10^{-24}m. And so on.

The spin radius will double, but the energy will not. A doubling of the spin radius will more than double the energy, due to the spherical nature of the particle. However, since each spin is circular, we don't need spherical equations. Circular ones will do. Yes, each spin is orthogonal to neighboring spins, and the spin complex is spherical, but each spin is circular.

This means that the Balmer equations should have been comparing energies, not wavelengths. I have shown how to do this with my quantum spin equations, which give us energies from spin radii. These are the spin energies of the electron:

$$[1 + 8], [1 + (8 \times 16)/2], [1 + (8 \times 16 \times 32)/2^2], [1 + (8 \times 16 \times 32 \times 64)/2^4]$$
$$= [1 + 8], [1 + 2^6], [1 + 2^{10}], [1 + 2^{14}] = 9, 65, 1025, 16385$$

But the Balmer series problem gives us a further complication, in that the electron orbit is not just a function of the ambient charge field and the energy of the electron. It is also a function of the energy of the proton. You see the proton is recycling charge, so if we excite the ambient charge field, the proton will be recycling that excited field as well. Since the electron is circling a charge eddy around the axis of the proton, this charge eddy will also be excited. So we have three players in this game: the electron, the charge photons, and the proton. As with the Bode equation, the current Balmer equation is a simplification of the problem, expressing the math with too few variables and too few fields. To see the mechanics and to include all the physics in the math, we have to write our equations in the proper form. The current Balmer and Rydberg equations do not do this. They are in an opaque form that hides the mechanics and the physical interactions. But rather than solve by energies, let us start by subtly rewriting the Balmer equation:

$\lambda = 8r_\gamma c^2[m^2/(m^2 - 4)]$
$\lambda = 8r_\gamma c^2/[1 - (4/m^2)]$
$\lambda = 8r_\gamma c^2/[1 - (2/m)][1 + (2/m)]$

What did I just do? I wrote the Balmer constant as an expression of the photon. Then I factored the variable term, to represent the ambient charge field and the charge field recycled through the proton. The motion of the electron in the charge eddy is a balance of the external field and the field "pull" from inside the proton. As I put it in a previous paper, the electron is caught in this charge eddy like a pingpong ball that wants to go down a drain. But it is too big so it just circles the hole. In this way, the electron is feeling charge forces from both directions. That is what the 1+ and 1- terms indicate above.

Now watch this: We know that the energy of the electron in hydrogen level n=2 is 3.4eV. That is $13.6/n^2$. That is currently taken as the energy of the electron. What is the ground state of our photon, as a matter of energy? Well, if we take the constant B in the Balmer equation to be the wavelength of our charge photon, then of course we can just calculate an energy like this:

$E_\gamma = hc/\lambda = hc/3.6456 \times 10^{-7}m = 3.40eV$

Shocker, right? **It turns out the quantum equations aren't really following the energy of the electron. They are following the energy of the photon.** The number 3.6456×10^{-7}m is a common photon wavelength, being in the infrared. It is much too small to be the wavelength of the electron. Remember how I showed in my last paper that one of the central mistakes in the Bohr equations was in the assignment of the momentum? He fudged from Δp to p, mistaking the change in momentum for the momentum. Well, the change in momentum of the electron *is* the momentum of the photon. That is where the switch was made. All these mainstream equations apply to the photon field, not the electron.

Of course that is easy to see with the Balmer equation, since it is explicitly tracking the wavelenth of the photon. But the Bohr equations were doing the same thing, and we can tell that because they get the same number, 3.4eV. Which means that this equation from my last paper

$E = 9mc^2\sqrt{\varepsilon_0}$

must also apply to the photon. Even though we put the mass of the electron in to solve, the energy we get is the energy of the photon! Even though we have the gravity of the proton in the equation, the energy is the energy of the photon! That is because what we are finding is the energy of the photon in that particular unified field. That photon's energy is not constant, and it can change as it moves away from the proton and electron. That is why the charge photon has a different mass and energy in these equations than in my equations in other papers. In those papers, I am not finding the charge photon as it exists right next to the proton. I am finding it much further away, in a different sort of ground state.

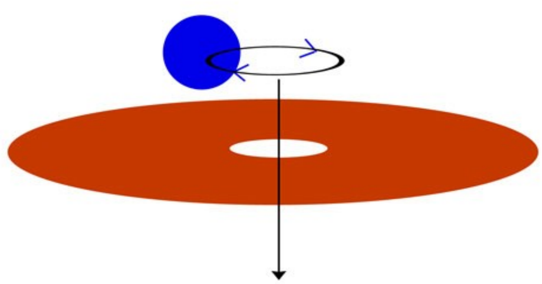
This is important because it tells us a new general rule: the energy of the charge photon can vary.

Previously, I have treated the field as if the charge photons cause everything. They still do in a sense, but it turns out to be a two-way street, like all other known interactions. As the photons affect matter, matter also affects photons. I have already told you that charge is greater near matter, because charge density is higher near matter. And the mainstream already knew that anyway. It did not express it as a real photon density, but it was aware of the fact. But it isn't just a matter of density. A denser field of photons will cause more photon-photon collisions, and the photons themselves will gain spins and therefore energy. This explains a lot of things, but we will save that for a future paper.

This also applies to the de Broglie wavelength, because whenever they use the equation E = h*v*, they are finding the energy of the charge field *around* the electron, not the energy of the electron. Those equations come from these equations, and they rest on the same conflation of Δp for p and ΔE for E. The de Broglie wavelength isn't the wavelength of the electron, it is the wavelength of the accompanying photons. I have shown that the electron does have a wavelength caused by its outer spin, but it is much larger than these de Broglie wavelengths. As the electron approaches c, its wavelength approaches 1m. At .01c, its wavelength is 1cm.

But this helps us here, because it means both the Balmer equation and the Bohr equations are tracking the field energy or photon energy, not the energy of the electron. Some would say, "If that is so, then do we even have evidence of an electron? Could the electron just be a shape in the charge field—an eddy and nothing else? Haven't there been theories of this?" Well, everything *could* be taken as an eddy or shape in the charge field, but logically something must be causing that eddy. The thing that is causing the eddy we call the particle. So we will keep the atomistic terminology, for the sake of convenience if nothing else. The cause of the local spins or waves is the particle, so we will keep the electron.

What this means for our revamped Balmer equation is that the plus and minus terms are representing changes to the field on the inside and the outside of the electron. By "inside" the electron, I don't mean the electron interior, I mean nearest the hole in the proton. Consult this diagram:



The electron is feeling both a pull and a push. A pull from the proton and a push from the external field. That is what the plus and minus terms represent. By "inside the electron" I mean the field in this diagram between the electron and proton.

When I say pull, I mean an *apparent* pull caused by field differentials. In a strictly mechanical sense, there are no pulls, and I am not changing that. But the drawn arrow *is* created by the field potentials, and in the interaction between electron and proton, it will indeed create the appearance of a pull. The photons are pushed into that charge low and the electron simply follows them.

Those who haven't read my other papers will ask why I diagram the proton as a disk rather than a sphere. This is just to represent the proton's charge field, which, due to the proton's fast spin, is recycled mostly in one plane. This allows me to draw it as a circle rather than a sphere, greatly simplifying both the diagram and the math.

Others will ask me how I know the proton has a hole along its axis, one big enough to allow photons in but not electrons. A good question, and I don't *know* it. I deduce it. Nor is it such a difficult deduction. I am not saying the proton has an actual hole in the pole, I am simply deducing that the proton shell is porous to photons and not electrons. The proton is some 6 billion times larger than the photon, but is only 1821 times larger than the electron. So you can see that the idea is not such a stretch. I draw the pole as a hole only to indicate that this is where photons tend to go in. Since the angular momentum is greatest at the equator, that is the *least* likely place for them to go in. Conversely, and for the same reason, the pole is the *most* likely place. The electron cannot go in anywhere, but it is pushed to the poles by the photons, where it gets caught in an eddy.

$\lambda = 8r_\gamma c^2/[1 - (2/m)][1 + (2/m)]$

Now that we have our new transparent Balmer equation, we can also see proof of my quantum spin equations and my cause of quantization. The number two in the terms is telling us that we are doubling the spin radius each time, as I have been telling you. And the m is just telling us how many doublings we have.

So you see I have told you where the number 4 is coming from, at the same time I have proved my doubled wavelengths from my old superposition paper. I have made the Balmer equation completely mechanical and transparent. They just needed to factor the equation to get the field above and below the electron.

I have also shown proof of my nuclear diagrams and my contention that the proton and nucleus recycle the charge field through definite channels. The 1+ and 1- terms are proof in the math of my field channeling by protons.

Of course we can then revamp the current Rydberg equation in the same way, since it has a constant based on B and is just a rewriting of Balmer's formula using wave numbers instead of wavelengths. But I point out that the Rydberg equation is even less mechanical and transparent than the Balmer equation. And that is precisely why it replaced the Balmer equation. We are told it was mainly to extend the Balmer equation to cover more absorption lines, but it was mainly to hide the mechanics and the mechanical problems even further. I was able to unwind all this only because I started from the Balmer equation, which retained some hints of the real mechanics. For example, no-one is taught today that the Balmer constant has a value of 3.4eV. That would open a whole can of worms, a can the mainstream wishes I had kept closed. To keep that can closed, quantum physics buried the Balmer formula long ago beneath the newer and foggier Rydberg formula. We see this perfectly in the current propaganda at Wikipedia:

As stressed by Niels Bohr, expressing results in terms of wavenumber, not wavelength, was the key to Rydberg's discovery.

Bohr loved to hide mechanics under opaque math. The begged questions bothered him and he wanted to get them all out of sight as quickly and thoroughly as possible. This is why he was friends with Heisenberg, who felt the same way. This is where the Copenhagen interpretation came from. It was a hiding of the mechanics under a huge and ever-growing pile of math.

Now that we have uncovered the field mechanics of charge, we see that the quantization in the old equations has always applied to the quantization of the photon, not the electron. In other words, you should have noticed by now that we have quantum levels in the photon field, not in the electron orbit. Yes, the electron is "excited" by increased levels in the photon field, and the energy of the electron does change in response to this. And, yes, the *energy* of the electron does therefore look quantized also, since it hits some levels and not others. But all this is caused by the spin levels of the photon, not the spin levels of the electron. The photon is quantized in this problem, but the electron is not. We aren't studying the electron spins here (although it has them, see my levels above). We have been able to solve by totally ignoring the spin levels of the electron. The electron is not gaining energy by adding spins or changing its wavelength. The photon is. The photon spin is quantized, but only the electron energy is quantized, you see. Not the same thing.

Therefore, the quantum equations have always been tracking levels in the photon. The first quantum number applies primarily to the photon. It is telling us how many stacked spins our charge photon has. The electron then increases its energy in response to bombardment by that field of photons. But (hold on to your hat) the electron does not hop up into another orbit. Since the levels apply to the photon, the electron has no orbital levels. All the *levels* in QED apply to the photon. QM and QED have been measuring the charge field itself all along, not the electron. This means that the electron is simply increasing its orbital energy *by going faster*. Since the electron was never going anywhere near c, it is able to take the energy from the photons and put them into velocity. It increases the speed of orbit.

I will be told that we know some electrons have larger orbits than others. Yes, but my nuclear diagrams explain that. Electrons with larger orbits are not quantized larger, they are simply orbiting protons that are in outer shells themselves. The nucleus itself has levels, so of course the electrons will follow those levels like the protons and alphas. This also explains why electrons in those outer levels have more complex spins. They have the spin from circling the hole, and then they have the spin from the proton circling the nuclear center. The nucleus itself spins, so the electron will have that spin, too. The electron will have the angular momentum of the level it inhabits.

This also explains the problems both Heisenberg and Schrodinger had in assigning all their waves. Every spin and orbit will cause the appearance of a wave in the equations, and although Heisenberg hid this problem better than Schrodinger, they both had it. Heisenberg and Born even criticized Schrodinger for not being able to physically assign all the waves in the function. But now we see why all the angular momenta aren't limited to x, y, z. This isn't the electron spinning in d number of dimensions. It is the electron inhabiting a complex space of spins and orbits.

Finally, we now also have an explanation for a margin of error in the current equations. The Rydberg equation is able to predict the Balmer lines to within about 6 parts in 10,000.* This while at the same time we are told that the Rydberg constant is correct to within 7 parts in a trillion. Here's a question for you: how can the constant in an equation be more accurate than the equation itself? The masters of manipulation tell us that R

cannot be *directly* measured at very high accuracy from the atomic transition frequencies of hydrogen alone. Instead, the Rydberg constant is inferred from measurements of atomic transition frequencies in three different atoms (hydrogen, deuterium, and antiprotonic helium). Detailed theoretical calculations in the framework of quantum electrodynamics are used to account for the effects of finite nuclear mass, fine structure, hyperfine splitting, and so on. Finally, the value R of comes from the best fit of the measurements to the theory. [Wiki]

So they are claiming to find a match of 7 parts in a trillion based on best fit? On curve fitting? You have to be kidding me. Curve fitting is an explicit push to match data, so you cannot use a best-fit method and then claim your margin of error is now almost nothing. These people are beyond shameless. They are mentally ill. The new math is a pathology, nothing less.

But the 6 parts in 10,000 is believable. In fact, I believe it. The reason I believe it is because it comes out to be about 1 in 1,667. The real margin of error is determined by the number 1,821, which is the differential between proton and electron. It is the size difference between electron and proton, so it is also the charge difference between electron and proton. **So this margin of error is proof of my contention that the electron has 1,821 times less charge than the proton.** The Rydberg formula is an equation that forgets to include the charge of the electron in the math. The charge that is implicit in the math is the charge of the proton. But the electron and proton are both recycling charge, so the total charge in the field of hydrogen is not e or e^2, it is $e + e/1821$.

That is the real way of getting your margin of error down: CORRECT THE EQUATION!

*Modern Physics for Scientists and Engineers, Volume 2, by Lawrence S. Lerner. p. 1132.