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PERIOD FOUR

of the Periodic Table

by Miles Mathis

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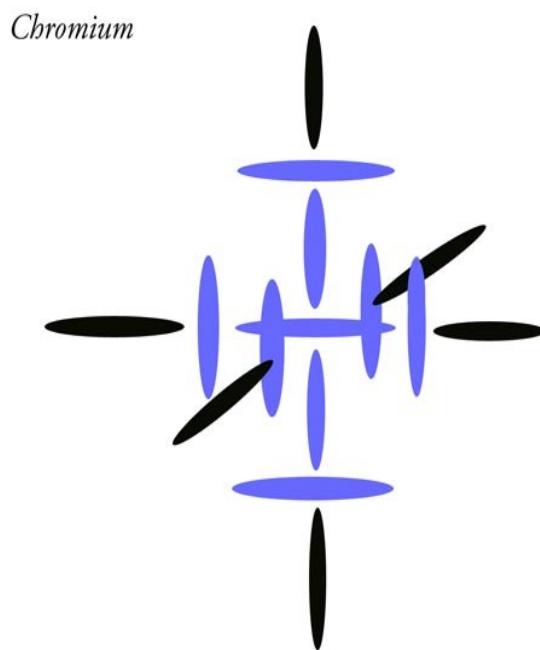
[In a series of papers](#) I have used my nuclear diagrams to explain nuclear construction, replacing electron orbital theory and the strong force. In doing so, I have completely rewritten the theory underlying the Periodic Table. In those papers, I have already mentioned an amusing episode, where one of my readers sent a link to a mainstream chemist, who apparently read about ten sentences and was aghast. He refused to read beyond the first pages, exclaiming, “This guy has just put the orbitals inside the nucleus. What is the point of that?” Well, that isn't really what I did, but those who have read past the first pages understand that the point of it all was to explain things more sensibly than the mainstream has been able to do, in the century they have been given to do it. By diagramming the nucleus, I have been able to give straightforward mechanical answers to hundreds of questions the mainstream has been able to answer only with “quantum mechanical” misdirection. In other words, the mainstream cannot answer these questions by drawing you a picture and explaining it with real motions and interactions. They can only explain most questions that come up by giving you unsupported equations—*ad hoc* and pushed equations created just to answer that question. If you ask for any mechanical assignment of the variables in those equations, they huff and puff and accuse you of being an old-fashioned poolball mechanic or naïve “classicist” (which they intend as a term of abuse). Don't you know that nothing makes sense at the quantum level and that nothing can be diagrammed? Don't you know that everything is just a blurry cloud, and that the best we can do is juggle some huge undefined statistical equations? Don't you know that all the famous guys from Bohr to Feynman told you to shut up and calculate? So why are you still asking physical questions of physics!

As I have said before, those who are satisfied with non-physical answers to physical questions can stick with the mainstream theories. But I am not at all satisfied with them, and I find that my thousands of readers are not satisfied with them, either. In just the few months I have been working on these diagrams, I have already provided answers to many basic questions, and my answers are clearly superior to the answers given us by the mainstream. As just one example, I recommend you to my answer for the question of [why Mercury is a liquid](#), while the elements around it are not. I am able to draw you a simple picture, explaining why the charge field links must be weak.

Despite the undeniable success of my diagrams so far, I find that many find it easier to continue to dismiss me, and they use as an excuse all the problems I have not yet solved. I get emails from people who ignore everything I have done, and they instead hit me with a long line of questions: what about x, what about y, what about z?” As if I can rewrite all of quantum mechanics overnight, while at the same time rewriting all of gravity theory, all of Relativity, and all the equations of motion. I tend to simply ignore these people as ingrates, and I work on the problems as I get to them. That is what we have here. I work on my own schedule, and I was ready to work on Period 4 today.

One thing that brought me to a close analysis of Period 4 is the element Iron. I have recently reworked parts of [my paper on magic numbers](#), trying to hit the right elements and diagrams to make my point. Current theory tells us there is something magical about Calcium, but I have shown (and will show again below) that by the given definitions, Calcium is less magical than several elements in Period 4. With more study, I have found that the current equations to determine what is “magic” are pushed. They are based on false assumptions and math rigged to those assumptions, so we could dump the whole idea of magic numbers without losing anything. However, if the idea of magic numbers does anything, it leads us into a discussion of which elements are filling levels, and what that level filling means for their characteristics.

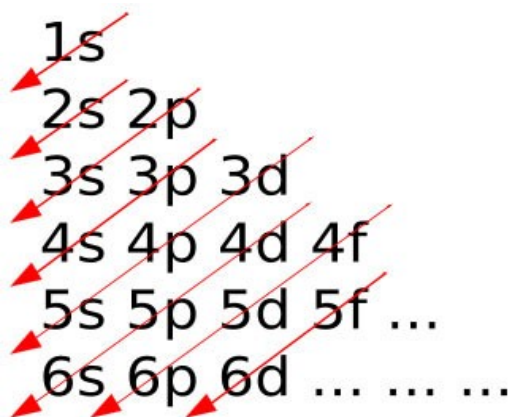
I have already shown that it is Chromium that fills the fourth level, by one definition, at least.



In my theory, the fourth level is represented by the positions of the six black disks here. Since Chromium is the first element in Period 4 to fill them all evenly, Chromium fits one definition of magic number. It certainly fits that definition better than Calcium, which only fills the top and bottom slots.

So why does current theory think Calcium is special? Well, according to the theory of magic numbers, it is because Calcium “completes its shell in the nucleus.” As I pointed out before, this must mean the atomic shells don't match the electron shells, because the number 20 wouldn't be special in electron

orbital theory.



We are told that in nuclear shell theory, the numbers 2, 8, 20, 28, and 50 are magic. But as we see from this diagram of the Madelung rule, those numbers don't fit either the electron shells or the Madelung rule. Calcium fits the Madelung rule, sort of, since Calcium would be the sum of the first four arrows. But then the sum of the first three arrows is 12, which isn't magic. Most people haven't found this to be a problem, because they just reply, "No, nuclear shells and electron shells are two different things. Why should they match?" Well, my diagrams now answer that question, because I show both that they *do* match, and *why* they must. They match because the electrons are orbiting the proton poles, not the nucleus as whole.

But the nuclear shells should have logically matched the electron shells even before I arrived with my diagrams. If electrons and protons are charge-matched in the atomic scheme (as they are) then the electron shells should match the nuclear shells. Given current theory, the fact that the two sets of shells didn't match should have been a problem for the theory of charge separation, since if the shells don't match, the charge separations don't match. If the charge separations don't match, the total charge of the atom gets skewed. I would think that should have been fairly obvious from the beginning, and once upon a time it probably was. It is just one more thing that has been buried under the big maths piled on top of the nucleus and atom. The physicists of the 20th century soon discovered that if they swamped the atom with enough difficult math, the old problems could be inundated by a sea of mathematical manipulations. Hence the "shut up and calculate" mantra.

But even if we dispense with the theory of magic numbers as unsupported, we still have the electron orbitals to deal with. Many physicists and chemists could give up magic numbers and nuclear shells without much stress, but they are very attached to the electron orbitals. So let us move on to the next question: why does the mainstream now think both Potassium and Chromium have one electron in the outer shell? My diagrams confirm that Potassium does, but not Chromium. Not surprisingly, Chromium is one of the elements that breaks the rules of the mainstream, including the Madelung rule (aka Aufbau rule) of filling orbitals. So the answer to this question is that Chromium is given one electron in the outer shell because of the way it acts in experiments. In experiment, we find one, not two, electrons available for easiest ionization, and this fact is used to propose that Chromium has only one electron in the 4s shell.

However, from Chromium's main oxidation states, we can tell that my diagram is correct and the mainstream answer is wrong. Chromium's primary oxidation state is +6, which confirms my diagram. And we can explain the one electron in a more direct way as well. Here is why Chromium seems to

have one electron in the outer level:

Because the nucleus is mainly a recycler and channeler of charge, when we answer any physical question, we have to follow the charge channels. I have already shown that the axial level is the most important level in the nucleus, and this would be clear regardless. The charge is entering the nucleus at the poles, so those top and bottom positions must be primary and privileged, no matter what else is going on. Just like the galaxy and Sun and Earth, the nucleus is pulling charge in at the poles and releasing most heavily at the equator, so the axial level is mainly pulling charge in and the carousel level is releasing charge. So although our six black disks with Chromium look to be in the same fourth nuclear level, they are not equivalent in all ways.

Even the top and bottom positions are not strictly equivalent. Because the ambient charge field is not balanced regarding photons and antiphotons, any nuclei in our part of the galaxy will not be channeling a balanced field. In other words, more photons will be going in the south pole than the north. I use north and south here simply to match my analysis of the Earth and Sun. For this reason alone, the bottom position in the fourth level will have about twice as much charge passing through it. In any experiment, this will give precedence to that position. In other elements where we have more protons at the top and bottom positions, this differential will be drowned out to some extent. There will still be ionization differentials between those two “s” electrons, but because the differential is split in more ways, it won't be as obvious. It is most obvious here with Chromium, because we have only one proton north and south—and thereby only one electron north and south. The south electron will appear to be primary in some experiments, and that is what we are seeing. See my [recent paper on Osmium](#) for more on this.

I called the axial level electrons “s” electrons above, because in this case the mainstream is mistaking my axial positions for “s” positions. In situations like this (but not all situations), the axial positions will mimic the characteristics of “s” orbitals, and they do so for the reason I just gave. These axial positions provide the ionized electrons, and with smaller elements these positions can mimic the “s” positions. This isn't true with larger elements, because even though the axial positions continue to provide ionized electrons, there can be up to six protons in the top and bottom positions. This fact fools the mainstream into thinking those ionized electrons aren't coming from “s” positions, but since my axial positions are the analogues to the “s” orbitals in current theory, all ionized electrons are really coming from there.

The reason all ionization is coming from the top and bottom positions is easy to understand if you follow the charge channeling. Since charge is coming in those positions, it will be far easier to ionize those electrons than the ones in the carousel positions. Why? Because charge is coming *out* the carousel positions, and so any energy you apply to the nucleus will be blocked by charge released along the equator. When you apply energy to the atom to knock out an electron, that energy is going to be applied preferentially to those pole positions. The energy you apply will be either moving photons or moving ions, and both must follow charge channels.

We see proof of this straight from the ionization energies of Chromium. The first ionization energy is 653 and the second is 1591, which is a ratio of about 2.5 to 1. From my explanation, we would have expected a ratio of 2, but the second ionization energy is measured on Chromium that is already singly ionized, and we would expect an ion to be holding onto its second electron a bit more strongly than the atom was. Why? Because once you knock that first electron out of the hole, the hole is unblocked and can therefore admit more charge. In our example of Chromium, the north pole electron will be knocked out first, you see, because less charge is holding it in that hole. Remember, I explained the

electron circling the proton pole like a pingpong ball circling a drain. It wants to go down but it can't because it is too large. So the current pressure makes it circle the drain. Well, if you get the pingpong ball out of the drain, the current is blocked less and it actually strengthens. Same thing with the nucleus. The newly created ion isn't just charged more because it now has an empty eddy for an electron to fall into, it is actually charged more absolutely—as a matter of local charge strength—because that eddy isn't blocking any charge. Well, if the suction at the north pole increases, the suction at the south pole will also increase. Our potentials all around the nucleus will change, not just the potentials at the north pole. Why? Because all the potentials are of a piece. All potentials are ultimately measures of charge densities, and the charge field, although split into photons and antiphotons, is basically a single field. If a low is created, it will attract both photons and antiphotons without discrimination. Therefore, in most situations a charge density increase will imply an equal anti-charge density increase, and vice versa.

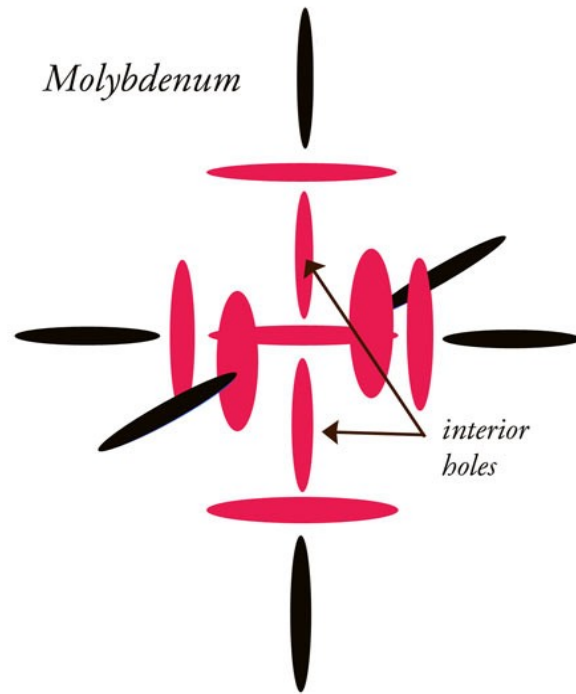
So, this means our south pole electron is now bound more in the ion than it was in the atom. Therefore, we would expect the south pole electron of Chromium to be *more than* twice as difficult to free as the north pole electron was. But can we explain the .5? Why do we see 2.5 instead of 2, a gain of 25%? Well, the increase is actually about 21.8%. $1591/2=795$. $795 - 653 = 142$. $142/653 = 21.8\%$. Which means the north electron was blocking 21.8% of the charge. How can it do that? According to my theory, if we look only at radius, the electron can be recycling $1/1821$ the charge of the proton, or .055%. But here we have to look at not just the electron radius, but the electron spin. Remember, the electron has a magnetic moment that is known by the mainstream to be 658 times larger than that of the proton. So we would actually expect the electron to be capable of blocking 36.1% ($658/1821$) of the charge coming in. The electron has a much higher spin speed, that is, so it creates havoc in that pole eddy, acting like a little charge blender, spitting out large amounts of charge to the side and preventing more than a third from entering the nucleus.

From the difference between 36.1% and 21.8%, we can now calculate the distance of the electron from the pole. If the electron were no distance from the pole, it would be capable of blocking 36% of the incoming charge. Since it is blocking about 40% less than that, it must be about 1.5 electron radii away [$.36^x = .218$. $x \approx 1.5$]. This is the radius of our eddy, proving the electron is orbiting the eddy with a real motion and a real angular momentum.

This short math I have done above now tells us why elements ionize before bonding. We have just seen that Chromium can create a bond over 20% stronger by kicking that electron out of the eddy. But of course it is not a choice of the element to ionize itself. What causes ionization before bonding is the other element nearby. When the two charge streams meet, the second charge stream blows that electron out of the hole before bonding. It is not a choice, it is a natural outcome of bonding. When we are manufacturing these bonds, we can blow the electron out of that hole by other means—as when we introduce external charge via an electrical current or magnetic field. This sort of forced ionization then makes it easier for us to introduce the second element into the molecule, you see.

But let us move on from Chromium and look at other problems in Period 4. The nuclear densities of the elements in the middle of the Period led me into the diagrams of those elements, since those densities are difficult to explain with current theory. What we find is an increase in density up to Copper and then a fall off from there. I will show this is mainly caused by the filling of inner positions—positions the current shell model doesn't have. Because I have these inner positions, I was able to

[explain the radioactivity of Technetium](#) with ease, and I led with that solution when I unveiled my model. The same positions allow me to easily explain the density variations in Period 4.

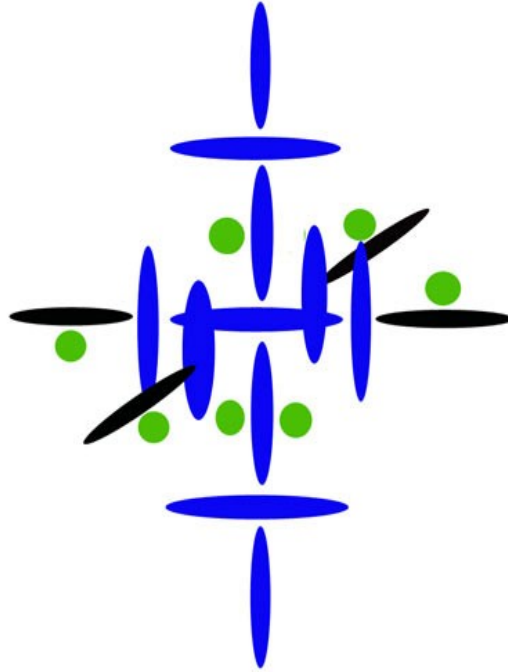


Although Molybdenum is Period 5, this diagram is the one I used to show the interior holes. Just like Chromium above it, Molybdenum leaves those holes unfilled by protons. Elements in lower Groups on the Periodic Table can leave those holes unfilled by protons, since they have less mass in the outer shell. But as we put more mass in those six fourth level slots—especially the carousel slots—we increase the angular momentum of that level. At a given point, we have to counter that force out by putting more mass on the axis. The most efficient way to do that is to fill those inner holes, with either protons or neutrons.

Filling those inner holes has a double effect. First, it creates more mass closer to the center of the nucleus, which increases the gravity of that level. This acts to counter the increasing centrifugal force from the fourth level. Second, it increases the nuclear density. As we have seen in my diagram of Osmium, the densest elements all have those inner holes well filled. From this alone, we can tell that Nickel, Copper, and Cobalt must have those inner holes well filled, and that the other elements around them in Period 4 must be filled less.

The other clue to the composition of these nuclei is seen in the high magnetism of Iron, Cobalt, and Nickel, as well as the conductivity of Copper. After several tries, this is my latest attempt at diagramming Iron:

Iron



Blue disks are alphas, which contain two protons. Black disks are single protons. Green circles are neutrons. I have drawn the neutrons smaller and as circles only as a convenience—to separate them from the protons at a glance, and to fit them into already crowded diagrams. However, I need to include the neutrons to explain the densities in Period 4, as you will now see.

Current theory thinks Iron has two electrons in an outer *s* shell for the same reason it thinks Chromium has one. Those two north protons [each blue disk contains two protons] will have the electrons that are ionized first, so they will seem to act like a level all their own as regards ionization. But regarding other characteristics of Iron, my diagram is clearly superior to the current one. We can explain its increased density over the elements below it by the increase in nucleons on the axis. Since those top and bottom alphas are on the axis, they have very little angular momentum. It is the carousel protons, both blue and black here, that have most of the angular momentum. Therefore, putting protons in those top and bottom positions is the next best thing you can do to putting them in the inner positions, as regards density. Although they are relatively far from the nuclear center, they aren't far from the nuclear axis, and in this case that is nearly as good.

Having all those protons on the axis also helps us explain the magnetic qualities of Iron (and other elements built like this). Magnetic strength is now given to domain alignment, but that has never been connected to any real mechanics. Here we can see that magnetic strength has more to do with charge conduction in both directions along the axis. Magnetism is not just a matter of charge strength. Nor is it a matter of charge density, since as we saw with Silver and as we will see with Copper, *electrical* conduction is better when there is a proton differential from top to bottom (see below), so that we get conduction in one direction only. What we have here is charge going straight through in both directions, or a sort of conduction in *both* directions (north and south). When that happens, we don't just have a *conducted* charge—which means the charge is going in one direction, and is capable of strongly carrying current with it. When we have conduction in both directions, we actually have doubly spun or *magnetic* charge. This charge may be weak in current, because photons are going both directions. But it has an augmented magnetism precisely because the charge and anticharge are being

made spin coherent.

What do I mean by that? It sounds esoteric, but it is actually simple. If you have antiphotons going down in a line through the nuclear axis and photons going up in that same line, your conduction may be poor because your photon traffic is going both ways. Your linear streams are canceling one another. But your magnetism will be augmented because—as a matter of spin—a *photon going up is the same thing as an antiphoton going down*. Photons and antiphotons are only opposite if they are traveling side by side in the same direction. In that case, their spins cancel and the magnetic field goes to zero. But if they are traveling in opposite directions, their spins actually stack, since they are the same. That is what we see here with Iron.

Notice that there are twice as many protons in the axis holes (two) as in the carousel holes (one). This means the carousel holes can't pull charge through as fast as the axis holes are pushing it in. So some of the charge gets pushed straight through the nucleus, coming out the opposite pole. This is what we call conduction. Rather than being *recycled* through the normal channel from pole to equator, the charge is *conducted* from pole to pole. Where normal charge recycling creates an orthogonal channel, conduction creates a linear channel. This linear channel can then align atoms and molecules, and the linear channel through many molecules can then drive ions, either via the linear motion of the charge—which is current—or via the spin of the charge—which is magnetism. Since Iron is conducting both ways, it is a better creator of the magnetic field than the electrical field. If the ambient charge field were balanced regarding photons and antiphotons, Iron would be an even worse conductor. As it is, Iron has to rely on charge imbalance in order to conduct at all. In other words, since more photons are coming in the south pole than the north, we don't get a cancellation of current through the axis. Iron can still conduct, though not as well as Copper or Silver.

The fact that Iron has no protons in the interior holes is also important to this equation, since those positions also draw off charge from the axis. If you have protons in those holes, you always have less conduction—both electrical and magnetic. This is why Iron, Cobalt, Nickel, and Copper all must have neutrons only in the axis holes. Any protons there would draw off charge from the axial level, lowering the conduction of both magnetism and current.

Now let us look at those neutrons in the inner holes. Most elements need to close those holes to maintain stability, since a completely open hole allows the ambient charge field to rush through. If the charge field isn't well balanced as a matter of direction, it can rip the nucleus apart from those inner holes. Only the smallest elements can let those holes remain open, and then only in cases where the charge field is very balanced. Since neutrons act as stoppers, one neutron is often enough to close an inner hole, as long as we are dealing with smaller elements and weaker charge channels. Larger elements as a rule have to stopper the inner hole from both sides, since it is open to both sides (unlike other alphas in the architecture). Charge can come through from either side, in which case it can blow a single neutron out from the opposite side. Iron is a bit of a special case here, because an element that is a strong conductor will have a lot of charge passing straight through, as we have seen. That conducted charge acts as a sort of negative pressure, pulling the neutron into the inner hole from the inside. So in elements like Iron, the neutron in an inner hole feels a bit of suction, adding to its stability. This is why one hole is stable with only a single neutron in it. Also notice that the single neutron is on the north side, which is the anticharge side. Because the ambient field is not balanced, the top half of the axial level has less charge to deal with, both internally and externally. For this reason, Iron can get away with this relatively small internal lack of balance. The internal lack of balance matches the external lack of balance, you see.

To see how poor the current answer is, we can look at the mainstream's explanation of Iron, Cobalt, and Nickel, three elements with the highest magnetism. We are told that magnetism is caused by unpaired electrons, but do we find that with these three elements? No. To start with, the mainstream electron configuration of Iron is 2, 8, 14, 2. Since each shell has an even number, there aren't any unpaired electrons. For magnetism to have anything to do with unpaired electrons, we would have to be dealing with ionized iron. But un-ionized iron is magnetic as well, so the answer is misdirection. To explain Iron, Cobalt, and Nickel with unpaired electrons is impossible, since they are right next to each other on the Periodic Table, being elements 26, 27, and 28. They could not all have an odd number of electrons, could they?

To answer this, we are sent to Hund's rule, which tells us that electrons don't pair up unless they have to. Therefore, in Iron's level 3, which can take 18 electrons, the first nine will go in with the same spins, then the last 5 will pair up, leaving 4 unpaired. After consulting my diagrams, we now know this rule must be false, and that it was made up to match data. So why was it manufactured? It was manufactured simply to explain magnetism. Without Hund's rule, no element with an even number of electrons could be magnetic. To explain very conspicuous data, it was clear that atoms needed to maximize unpaired spins, and that is what Hund's rule does. The mainstream even admits this. At Wikipedia, we are told,

Hund's rule of maximum multiplicity is an observational rule which states that a greater total spin state usually makes the resulting atom more stable.

Notice, it is an *observational* rule. What does that mean? It means the rule was obtained by working backward from data. It was not a rule predicted by theory, it was a rule added later to explain things the theory couldn't explain. So, although it breaks symmetry rules, they keep it anyway. Without it, they can't even begin to explain magnetism. But even *with* it, they can't explain magnetism, since those electron spins are part of either orbitals or clouds. In either an orbital or cloud, the spin cannot sum over time into any vector. Without that vector, you have nothing to sum out into domains.

Just think about it for half a minute. The orbitals used to be defined as closed paths, normally ellipses. But having electrons move on real orbitals caused all sorts of problems they couldn't solve, so they gave up on real paths. They also gave up on real spins. The spin of the electron is now said to be *intrinsic*, remember? Not real. If you try to diagram it or think of it as real spin, they shout you down as a caveman. The electron also doesn't travel on a defined path. Its position is only a probability. Unfortunately, to get any spin that you could later sum into a vector and align in domains, the spin would have to be *real*. Beyond that, the electron would have to be frozen at some position relative to the nucleus. If it moves relative to the nucleus (in any way), then it also moves relative to neighboring domains, and if it moves relative to neighboring domains, the alignments are shot. And, since these unpaired electrons in Iron cannot share the same path anyway, they are bound to get out of alignment as they move. Yes, they are in the same 3d subshell, but the four electrons cannot be material and still share the same path, Pauli Exclusion Principle or no PEP. Therefore, as they travel, they must continually unalign—if they ever were aligned to start with.

I will be told that the positions don't have to align, only the spins, but that would imply that the paths of the four electrons in Iron must at least be planar, or parallel to one another. That would be another *ad hoc* rule, one we have no other evidence for—except the magnetism we are trying to explain. It would also push QED out of the cloud and back into the ellipse, since although ellipses are planar, clouds are not. Probabilities are not planar.

But we really don't have to waste any more time trying to salvage Hund's rule, since I have already proven that electron orbital theory is a contradiction of the field definitions from the start. There *can't be* any electron orbitals, clouds, or anything else, and I know that because I know that all these theories historically came out of molecular bonding theories. Ionic and covalent bonding predated all this later mess, including Hund's rule, Madelung's rule, and all the rest. All these later manipulations were brought in to salvage ionic and covalent bonds. But since ionic and covalent bonds were illogical from the first word, all the later work was wasted. Electron bonding flouts its own postulates and field definitions, so *it must be false*. [See my paper on electron bonding](#) for simple proof of that.

Elements don't bond through the electron configurations, they bond through focused charge channels, and it is the nucleus that create these channels. All bonding is determined by nuclear configurations, not electron configurations. The electrons do have configurations, as we have seen, but these configurations simply follow the proton configurations. The electrons are only along for the ride.

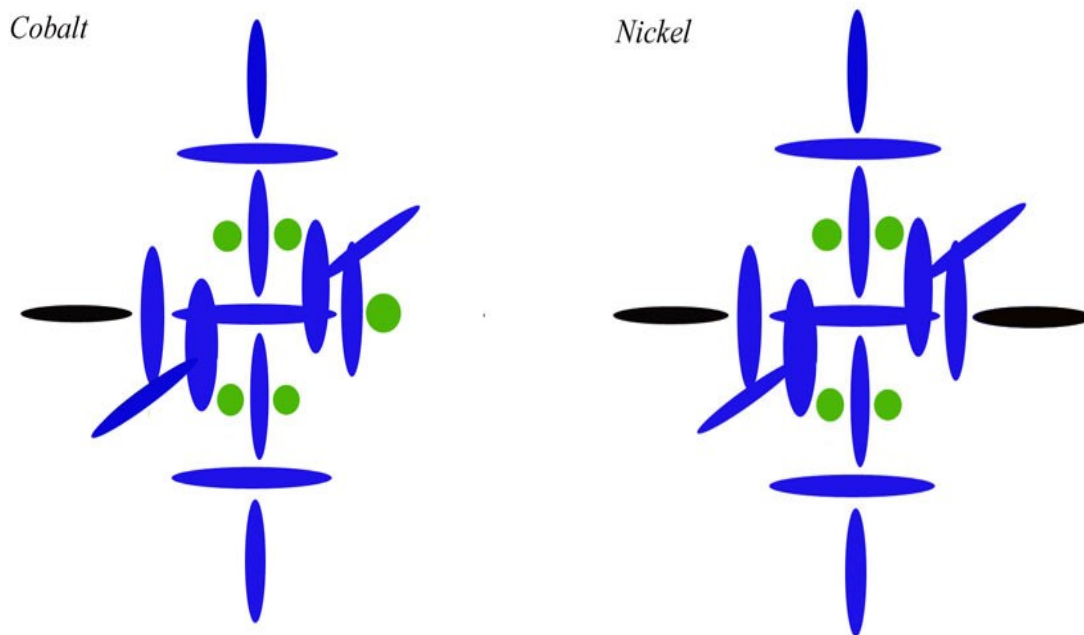
Amazingly, although we have never had any proof or indication of electron orbitals, we have had proof of nuclear charge channeling for decades. This proof has simply been buried *on purpose* by dishonest physicists (and chemists) who saw this proof was fatal to their own theories. As I mentioned in my first paper on this, Robert Hofstadter won the Nobel Prize in 1961 for his work on the nucleus, showing clear proof in experiment of charge channeling. He showed the channels where charge was going in and coming out of the nucleus, corresponding to my channels in diagram. But because this data threatened electron orbital and bonding theory, and because it also contra-indicated strong force theory coming out at that time, it was buried. It was buried by the top physicists of the 1960's, including Murray Gell-Mann and Richard Feynman (and all the others). Go to Hofstadter's page at Wikipedia, and you will see how truncated it is. It must be the shortest page of any Nobel Prize winner. His work has simply been suppressed.

The top physicists since the 1960's have all told us that quantum mechanics, QED and QCD, are the greatest achievements in the history of physics. The truth is just the opposite. These theories were garbage from their inception, and are among the worst theories ever promoted. Why? Because they are all built on electron bonding and electron orbital theory. Electron bonding theory goes back to 1904, when orbitals were first proposed by Nagaoka. Back then, the orbitals weren't a bad idea, given the current data. But as the century progressed, it should have been seen that the orbitals failed. In fact, it *was* seen. The failures were obvious by the 1920's, which is why quantum theory hid in statistical math and clouds. Rather than admit that electron orbital theory was not salvageable and look for something else, they preferred to keep it and fake all the equations. All these mechanical questions I am digging out and solving have not only been hidden for almost a century, they have been *forbidden*. A huge amount of protective pseudo-philosophy has been promoted since the time of Bohr, attempting to shame anyone who asks physical or mechanical questions. What any honest person notices first about the quantum theories—even before noticing the major holes—is the astonishing levels of psychology and propaganda they contain. No one can seem to lecture for five minutes, or write a short paper, without reminding his audience that quantum mechanics is utterly new and improved, and that you shouldn't ask it to make sense. Any real physicist from the past, or any modern psychologist, would immediately read that for the mindgame it is. “Hi, I am here to teach you about quantum mechanics. By the way, it is really uncool to ask me any mechanical questions, since we have got beyond all that. New physics is way too hip to bother with diagrams or sensible cause-and-effect answers. We judge each other now on how big and convoluted our equations are, and on how many contradictions and paradoxes on each page we can sell as science.”

Some will find it digressive of me to sidetrack into these rants, but they are a necessary part of the

progression of physics at this point in history. The problems of physics will never be fixed until physicists and others interested in these problems understand the enormity of the fraud that has been perpetrated. I have seen a few angry physicists pointing to fraud in Relativity or string theory, but I haven't seen anyone unmasking the fraud at the heart of quantum mechanics. This cover-up surrounding the electron orbitals has remained one of the best kept secrets of physics up to the present time. Feynman and many others in the second half of the 20th century were such incredible salesmen, they were able to not only keep these problems hidden, but to glorify the hiding. They convinced several generations of physicists and chemists that *not* seeking answers to basic questions was more scientific—and more laudable—than seeking those answers. They glorified the mystery—as mystery—and actually diverted attention and work away from seeking solutions. We can now see that this was suppression of competition, as I showed with Hofstadter. The only way their terrible old answers could remain in the books is if their colleagues and students could be prevented from discovering better answers.

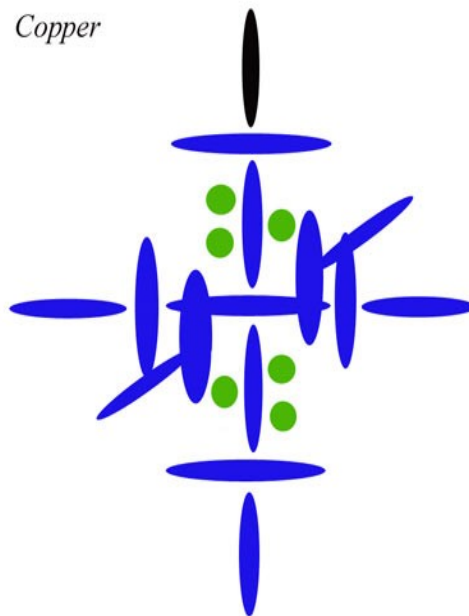
But back to Period 4. Since Cobalt and Nickel are also highly magnetic, they must keep the pole configuration of Iron, only adding neutrons to the inner holes to increase density.



All the blue alphas have two neutrons in them, so I don't need to diagram those. Cobalt is a bit peculiar, as you see, in that it has to fill one carousel level hole with a neutron. This is to maintain spin balance in the carousel level. This actually gives Cobalt more neutrons than Nickel, taking its atomic number above the element above it! Current theory can't explain that sensibly, but my diagrams provide the easy answer. Even with that balancing neutron, the spin balance is not quite perfect, and Cobalt spins with the tiniest of wobbles. Since the neutron only outweighs the protons by a fraction, this wobble is not fatal. However, it does explain why Cobalt is both more magnetic and more conductive than Iron. Although they have almost the same axial levels, with those blue disks top and bottom, Cobalt has two things Iron doesn't. One, it has both inner holes double filled. This closes up the leaks better and allows charge to pass from pole to pole more efficiently. Two, the neutron in the carousel level balances the spin, but it doesn't balance the charge emission. Even though that neutron is probably placed there with its pole pointing in—so that it *is* channeling charge instead of blocking it—

it can't channel charge at the rate the protons do, even so. Because less charge is being pulled through the carousel level of Cobalt, more charge is conducted straight through the poles.

Nickel is also somewhat less magnetic and less conductive than Cobalt, for the same reason. Nickel is more conductive than Iron because the inner holes are better filled. But it is less magnetic than Cobalt because the carousel level of Nickel is more efficient. Nickel, having six protons in the carousel level, pulls more charge through than Cobalt, which leaves a bit less charge to be conducted from pole to pole.



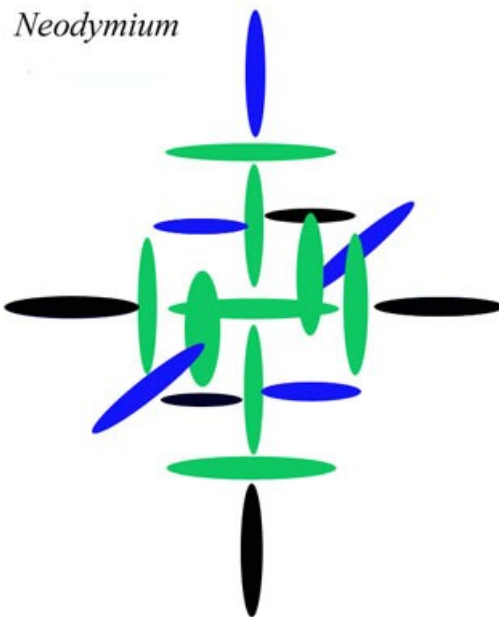
Now we move up to Copper, which is more conductive, less magnetic, and denser than the previous elements. The density is explained by the neutrons Copper has piled into that inner level. As you see, Copper has 31 nucleons on the axis, one more than Nickel. You will say, "Is that even legal?" Yes, the blue disks can take two nucleons in their holes, and these inner disks are open both sides. So the limit is actually eight. We could put four green circles top and bottom, and Copper only has three. It is true that those third neutrons are not bound in that position very tightly, but the inner level is the most protected level. A passing neutron could get in there and bump one out, but due to the position it is unlikely. Those inner positions are protected east and west by the carousel emitted charge, and by the axial alphas north and south. Any passing neutron would have to be well aimed to get in there and knock out one of those neutrons. Any passing neutron would be herded by the charge field that is going in the poles, and it would most likely bounce off those top alphas and be deflected that way.

I have already explained the conduction of Copper above, but now you see for yourself the differential from top to bottom. If you want magnetism, you look for elements with equal numbers of protons top and bottom. If you want electrical conduction, you look for a differential. I already showed this in a previous paper concerning Silver. This differential is what gives your photon field a summed direction. You don't want charge and anticharge cancelling one another in terms of linear motion, so you want charge moving more strongly than anticharge. That is what we see diagrammed here with Copper.

This is also why the magnetism of Copper falls drastically compared to the three previous elements. The differential helps conduction, but hurts magnetism. The other thing that hurts magnetism in

Copper is the fact that the carousel level is now blue all round. Remember, with Iron, the carousel level was black while the pole positions were blue. This is now reversed with respect to Copper's north pole. Since the carousel level is pulling charge through strongly now, almost none of the charge coming in the north pole will go straight through and out the south pole. This means that the double conduction of magnetism has been broken here, and the only magnetism Copper can transmit will be riding within its conducted current. That isn't what we normally call magnetic alignment, as with Iron or Cobalt.

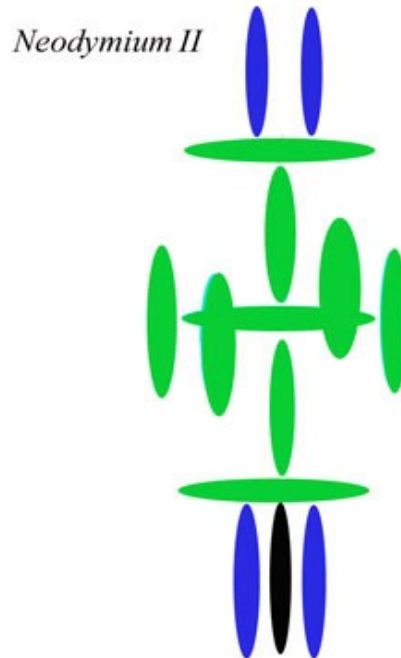
As a check on all this new theory, let us leave Period 4 to see if what I have said can be taken to other Periods. We know that Neodymium is also strongly magnetic in compound, so its diagram should be similar to the ones we have studied above. Is it? Roughly. We have a differential top to bottom, which would normally indicate conduction over magnetism. But Neodymium has closed those inner holes with a lot of protons instead of neutrons. Since protons are even better at cohering charge than neutrons, Neodymium can be both conductive and magnetic. Neodymium is pulling more charge through the carousel level than Iron, say, which is why Neodymium isn't normally either the best conductor or the most magnetic.



Since the mainstream has long thought that Neodymium was built up from Xenon [being Xe $4f^4, 6s^2$], it has completely mistaken its configuration. But in [a more recent paper on the Lanthanides](#), I have discovered they are all composed of a core of 45 protons, not 54. The green disk indicates a 5-stack, with a proton sandwiched between two alphas. This is why Neodymium acts nothing like Group 6 elements such as Chromium. We know it acts more like Group 3 or 9, and the diagram above tells you why.

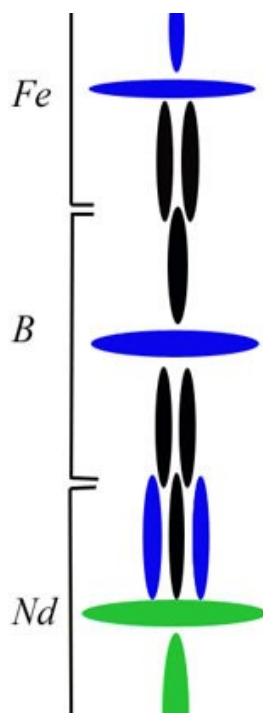
But if Neodymium is not the greatest candidate for magnetism by itself, how does it end up making the strongest magnet in compound? The answer is in the composition of the Neodymium magnet. When the compound is formed, it is formed in a strongly directionalized charge field, and that manufactured

field is strong enough to re-arrange these outer protons in the fourth level. The carousel level gives up its protons to the axial level, and we end up with all proton on the axis, like this:



That is a better magnet than Mercury, because although Mercury has four protons in each axial hole, it also has four in the carousel holes. So Mercury is drawing charge heavily to the carousel level and emitting it equatorially. NeodymiumII isn't conflicted like that, and it can conduct all its charge through the axis, in both directions. Samarium and Gadolinium have been rearranged in the same way, also creating strong magnets. Since both can be forced to have all protons top and bottom, they would seem to be even better candidates for magnets than NdII, and the only reason they aren't is that NdII can be linked to Period 4 magnets like Iron or Cobalt using Boron, while the others can't.

You see the trick is to create the linkage between the three protons of NdII and the two protons of Iron. Since Boron has five protons, it can provide that linkage. But a Samarium/Cobalt magnet lacks that linkage, and its bond is thereby weaker. It is about as strong, but not as sturdy. Obviously, Samarium/Cobalt needs a 2 to 4 link, which means it would need a double facilitator. This may have been tried, I don't know. I know Samarium has been doped with Carbon in superconductors, and I suspect the engineers may have tried Carbon as the facilitator between Samarium and Cobalt, due to the fact that the six in Carbon might link SmCo just as the five in Boron linked NdFe. But what they need is Molybdenum (or perhaps Molybdenum and Boron in sequence). I will show you why. Boron works between Neodymium and Iron because this plug sequence is created:

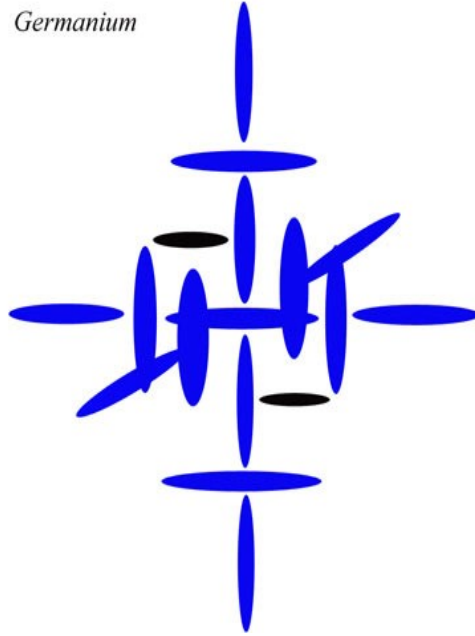


That is how the strongest magnet in the world is created. Of course, by analogy, Samarium and Cobalt would require a linkage through both Molybdenum and Boron. Molybdenum would be forced by the applied magnetic field to move its outer protons to the axis, where it would then have three on each end. This three-prong could then plug into both the two-prong of Cobalt and the four-prong of Samarium. If we then needed a link between three and two, we could use Boron as above. Fluorine might work even better than Boron, although being a gas would make it harder to cook into the mix by the current method. The Sm-Co linkage might also be made through Niobium and Beryllium, to similar effect, though of course in that case you would have to make sure your applied field was putting Niobium into the mix with the correct pole up. But since the current method has no problem aligning Boron in the right way, Niobium would probably align the right way naturally as well. These are some off-the-cuff suggestions, and they may create an even stronger magnet than the ones we have now. Having the diagrams helps me see these things more quickly and easily than the mainstream can.

OK, let's return to Period 4, to study the elements above Copper. Before we get to the tough ones, I want to briefly show you Germanium, so that you can see it is a candidate for a magic number, supposing we were still interested in such things. There is a huge fall off in density from Copper to Zinc, which means Zinc has begun putting protons in the inner levels, instead of neutrons. Protons weigh a bit less than neutrons, but this isn't the cause of the density loss. The loss is due to the fact that Zinc has only two protons down there, while Copper had six neutrons. This fact is also indicated by the low number of neutrons Zinc has, compared to previous elements. Copper had five more neutrons than Nickel, but Zinc only has two more than Copper.

The density of the elements continues to drop with Gallium and then Germanium, which means these elements also have only the two protons below, in the inner holes. The density drops because these elements add the new mass far from the nuclear center—in the fourth level—which lowers the overall density. So this is the diagram for Germanium:

Germanium

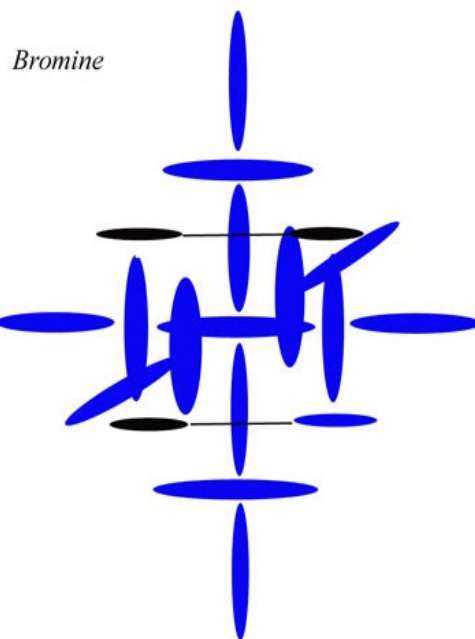


Beautiful, isn't it? That fills some levels evenly, doesn't it? But does it mean Germanium is magic? If it is, we don't know the spell yet. If we needed to create very square fields for some reason, Germanium would be our friend. It and Tellurium.

Now, let us move on up to Selenium and Bromine, which would seem to be a bit of a problem for my diagrams. Why should they be a problem? Because we are running out of slots. Arsenic isn't a problem, since its density is above Germanium. We just make those inner disks blue (leaving an outer one black). But since density drops for both Selenium and Bromine, things initially look bleak for me. We have to put more protons in those inner holes, and I have already said that should add to the density.

You may notice I don't seem too worried, and that is because the answer really isn't that hard, once you take a close look at things. Yes, we have to put all the protons down there, but protons on opposite sides of those inner holes don't act like neutrons. Since the neutrons are acting as stoppers, they fit very close in the holes. And when you have neutrons in opposite holes, they don't push each other out. Two stoppers opposite one another don't repel, so we had no problem and no side effects when we put a lot of neutrons in those inner holes.

But when we hit Selenium and Bromine, we have to put protons opposite one another in those inner holes. What should we logically expect from that? Well, since I have said many times the protons are acting like fans, pushing charge through the hole in a tight and defined manner, the protons will have to be affected by each other's charge currents. They are going to back one another out of the holes some distance, while remaining in the created charge channel. Like this:



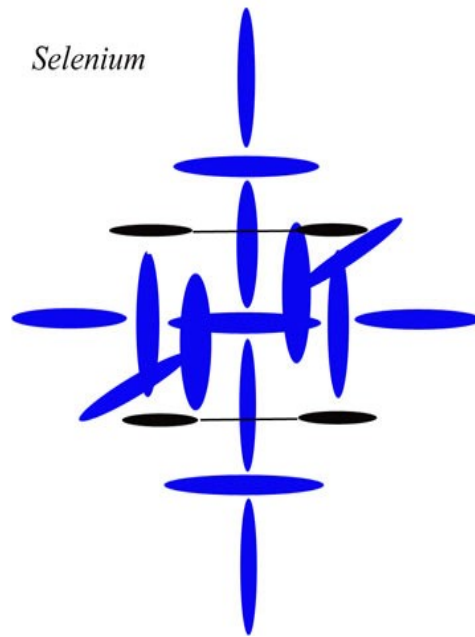
Since those “inner” protons are now pushed off the axis, they no longer add to the density as before. Like additions to the carousel level, they now subtract from density. Being off the axis, they are now spinning with the carousel, and they act like it in many ways. The primary way they act like the carousel level is that they feel a centrifugal effect from the nuclear spin, and the more protons you have in positions like that, the more centrifugal effect. This is why the density goes down for Selenium and Bromine.

Does this strange configuration explain why Bromine is a liquid? It does. Notice that if Bromine had to bond to itself using axis or carousel positions, it couldn't do it. It would have to be a gas, like the noble gasses. It doesn't have any openings out there, you see. All the holes are filled completely. So Bromine can only bond to itself via the inner level. Elements can do that, provided the inner level isn't closed tightly as we saw with Copper. Copper isn't going to be bonding to itself via the inner level holes. But Bromine has three positions open. Each hole where we see a black disk is only half full, so we have three openings. So Bromine can bond back to back on the west side here. Black to black will create a strong bond, which gives us the diatom of Br₂. But after that, we have a problem. To bond beyond the diatom, Bromine has to try to bond on the *east* side of this nucleus. As you can see, it can do that only on the top. No plug can be created on the bottom, since blue meets blue. There are no openings on the bottom. This leaves half the bond hanging, which is a weak bond. Hence the liquid state.

You will want to compare this bond to the bond [I showed with Mercury](#). Mercury encountered a very similar problem, since it was trying to bring together two plugs that were both 4/6. Two of the four prongs were left hanging, which I showed was a weak bond.

That nicely explains Bromine, but what about Selenium? Why isn't Selenium just all blue? Although that would seem to be incredibly balanced, it is clear Selenium isn't taking that configuration. If it were, then the density would rise. As we know, it falls—a *lot*. It is because Selenium is more like Bromine in diagram than Germanium. Although the all-blue diagram would look pretty, it doesn't work. Why? Because it actually creates a *lack* of balance. When you have a nucleus built *completely*

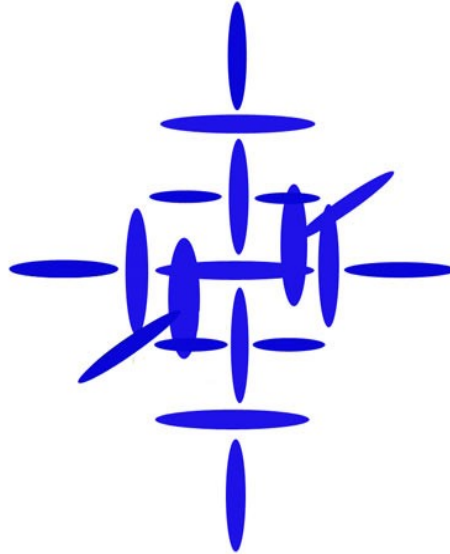
of alphas, you can no longer plug alphas into the inner axis holes in that way. To maintain balance, you have to split it, as we saw with Bromine. Selenium has to be built this way:



But why? Why can Arsenic plug alphas down below but Selenium can't? Well, Arsenic has a black disk in the north pole slot instead of blue. This means two things. One, it will be conducting some charge straight through, since the north and south channels aren't balanced. Two, it hasn't maximized its charge profile like Selenium has. Selenium is already pulling the maximum amount of charge through. The core can handle an alpha's amount of charge, and we have alphas in the top and bottom slots, pulling in charge in that amount. That wasn't true with Arsenic, but it is with Selenium. Now, if you plug alphas in both inner holes, you will be creating a channel for charge coming in from the sides to pass the axial level, which is good. Problem is, a tiny amount of that charge passing through will interact with the axis alpha. As we saw above, that can affect conduction by a tiny amount. Well, that tiny amount doesn't affect Arsenic, since Arsenic is not already at maximum in the core. But it does affect Selenium. Selenium can't take even a tiny boost, since it is already at maximum. Selenium has to split the protons. Splitting them means one proton pushes and the other pulls from the opposite side. This gives the charge less energy going in, but the same energy as two protons going out. After the charge passes *both* protons, it has the same energy it would have had from the one alpha, you see.

You will say, "That only cuts your 'boost' by a half. It doesn't take it to zero." That's true, and if the charge field were balanced as a matter of photons and antiphotons, that solution wouldn't work. If Selenium really were strictly at maximum, there is nothing we could do to solve this. But because we have a weaker channel coming from the north than the south, Selenium isn't really quite at maximum. It is near enough maximum to act differently than Arsenic, and to prevent us from plugging alphas below, but it isn't so near maximum that we can't solve this. If we couldn't solve this, Selenium couldn't solve it, and it would be like Technetium. So we must assume that this halving of the boost solves the problem. Selenium splits the protons in the inner level, and avoids dissolution.

Another thing that points to this solution is the fact that we can't plug four alphas below, either. Even though each inner hole should theoretically be able to take blue disks on each side, we don't see noble gasses being built like that. Notice that the building up of the fourth level and 4th Period ends at Bromine, which has an odd number of protons. You can't really finish off the 4th level, because Krypton doesn't look like this:



That confirms that we have to be very careful how we channel charge through those inner holes. The inner holes are very special in the nuclear architecture, and, as we have seen, groups 16 and 17 are a bit tricky. We already knew that from looking at Period 6, where Polonium and Astatine break down altogether.

In closing, I need to tie up one weak spot. I have said that those inner holes needed to be filled in most cases, to prevent the charge field from dashing through there and causing dissolution. But if protons are working like fans, pushing charge through, how does that prevent dissolution? If charge going through is dangerous, pushing charge through even faster won't help, will it?

Actually, it does, and this is because the danger from charge going through those holes was incoherent and/or unfocused charge. With no protons channeling charge, you of course have *unchanneled* charge. What is unchanneled charge? It is charge with no real direction. If those holes are open, charge can be arriving from any direction, with any spin. It will then move into that axis alpha on any vector, and most of those vectors won't be through vectors. In other words, the charge will go into the alpha, but it won't pass straight through. It will get into the alpha from the side and cause all kinds of trouble, since it isn't channeled charge. That alpha is channeling up or down, and so this unruly charge from the side is a menace. But once you put a proton in that hole, you have channeled charge. The charge is both spin coherent and linearized, so it passes straight through that axis alpha with minimal effect. I won't say *no* effect, since we saw above that protons in those holes can diminish conduction by a small amount. But with protons in the inner holes, the nucleus is in no danger of dissolution. The charge passes straight through in an orderly way.

I have now fielded a good question from a reader. He asks, "Don't you have charge being affected in opposite ways here? When channeled charge passes through the axis level, you say it interferes with

conduction. But then you say it 'boosts' charge in Selenium. Isn't interference the opposite of boosting? How can that work?" It works because Selenium isn't conducting. You get conduction with elements like Arsenic and Copper, which have different numbers of protons top and bottom. Or you can get magnetic conduction with elements like Iron, but then you need more protons in the axis than in the carousel. Neither of those things is true of Selenium. Therefore, when the crossing charge meets the main axis charge in Selenium, it can only boost the charge. Some charge gets captured, you see, which acts like a boost. Remember, the interference I was talking about with conduction is actually a capturing of charge as well. But because it is captured by charge that is being conducted through the axis instead of charge being channeled into the carousel level, it ends up lowering the total instead of increasing it. Just think about it: we add an equal amount of charge to the top and bottom inner holes. So the north charge is increased by the same amount as the south charge. But the south charge was twice as strong as the north to start with (because the south has two protons pulling in charge while the north has one). Therefore, after adding equal amounts to both, the north charge is no longer half the south. It is a tiny bit more than half. Which means when they meet, we now get a tiny bit more cancellation. The north charge is a tiny bit stronger than it was, so it cancels a bit more than half of the south charge, giving us less conduction. But since Selenium isn't conducting, it doesn't feel experience this cancellation. It only experiences the boost. When elements have equal numbers of protons north, south and in the carousel level, the axis charge is pulled into the carousel level from the nuclear center, and *so it never crosses*.

To read more about energy transfer by metals, you may now consult my newest paper on [the Drude-Sommerfeld Model](#), where I show a new definition of heat capacity, among other things.