

SEE, — **HOW** the complexities of **FIELD THEORIES** **HID** from us, the fact that **relative motion** (phase) between all these spinning entities, in the micro & macro universe, gives us **all** the **attractive and repulsive** **Fundamental Forces**.

Oct-29-2018.

Field Theories in html: <http://rbduncan.com/fieldtheory.html>

Also, **Field Theories** in Word: <http://rbduncan.com/fieldtheory.doc>

& **Field Theories** in Adobe pdf: <http://rbduncan.com/fieldtheory.pdf> Fitzpatrick's 1966 book showed the **relative motion** laws of A. Ampère unified the forces.

[Fitz's first book in 1966](#)

[Fitz's 1966 book in PDF](#)

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This was the way the site --below-- looked many years ago. - - Dan Fitz.

Schrödinger's Universe

One of the very best books, that has recently come out, is Dr. Milo Wolff's brand new book: ***Schrödinger's Universe***.

I've now finished reading it and I predict that someday it will be ranked in importance right up there next to Newton's ***Principia***.

Huygens — *famous for the first pendulum clock and wave theory of light* — admitted to Newton that the mathematical concept, in his ***Principia***, was brilliant but Huygens complained to Newton that it didn't tell us **why** gravity and

centrifugal force were happening.

Now, however, *Schrödinger's Universe* is finally beginning to show us why.

Wheeler and Feynman tried to prove the electron was a standing wave but failed. Milo Wolff did it by proving the electron was a **scalar**, standing wave.

I agree with the premise set forth in Milo Wolff's outstanding, new book that this is indeed a **scalar**, standing wave, **resonance** universe that gives us the answer as to why we have all of our *NATURAL LAWS*.

Dr. Wolff, by the way, was one of the few top mathematical physicists on the team that got us to the moon.

Dr. Milo Wolff has mathematically proven this main concept in his brilliant book: All electrons give and receive tiny bits of energy to and from each other, from as far away as the Hubble limit, and they do this basically (*in all directions*) in a **scalar** manner.

Milo has shown us conclusively that electrons are standing waves that keep reproducing themselves from electrons in their **surroundings**. Wolff has thereby shown us why this element of reproduction is so inherent to everything in our universe. This also implies that space is something that is constantly being reproduced as well and it's the *rate* that

space is being reproduced that brings the main reason for the length of this paper and its **surprise ending**.

Milo Wolff has also shown us **why surroundings** are so important; thus, he has shown us the reason for *Mach's principle* or **why**, as **Ernst Mach** stated in 1890, "The law of inertia depends on the presence of the fixed stars." (*Inertial mass depends on the far distant surroundings.*) Berkeley knew this even before **Mach**. And Einstein used this knowledge to create **General Relativity**. Milo Wolff is the very first person to give us a mathematical proof of *Mach's principle*, or that inertial mass is caused by the distant **surroundings**.

Quoting from the **Britannica 2009 DVD "Mach's principle:** It was so called by Albert Einstein after the 19th-century Austrian physicist and philosopher Ernst Mach. Einstein found the hypothesis helpful in formulating his theory of general relativity-i.e., it was suggestive of a connection between geometry and matter-and attributed the idea to Mach, unaware that the English philosopher George Berkeley had proposed similar views during the 1700s. (Berkeley had argued that all motion, both uniform and nonuniform, was relative to the distant stars.)"

Dr. Wolff emphatically emphasizes that the electron is a **scalar**, standing wave, **resonance** having certain spin resonance properties.

This is exactly the type of **resonance** universe that **Schrödinger** claimed we have.

There are even some more important "*firsts*" in Dr. Wolff's book as well. His book makes one really **think**: If our **NATURAL LAWS** fail to show us **why** or *how* inertial mass, gravity and the other forces are caused then is it possible we've not even scratched the surface yet? Is solid-state pioneer Carver Mead right? Are our **NATURAL LAWS** so bad that we are still in the *Dark Ages* of science?

Do these *Dark Ages* of science stem mainly from Maxwell's way of looking at it? Remember Einstein proved Maxwell wrong but Maxwell's math is being used every day and is super useful and accurate provided we remain within certain parameters: we must remain within certain speed and mass parameters and be wary of the micro and macro worlds. But if we remain within these parameters then we do indeed get beneficial use and math accuracy with Maxwell's concept.

Even before Maxwell, Ampere gave us a far different method to view electricity and magnetism using *relative motion*. With Ampere's method, **surroundings** are utilized and there are no parameters. There is a perfect understanding of how everything works but no accuracy with Ampere's concept simply because we do not have the super-computers yet that can work out all the necessary **phase** details in the **surroundings**.

If you are given another eye to see things with (*Ampere's concept*) then why not use it?

Using Ampere's concept, we find an extremely relevant **definite** *misalignment* factor of electron spins in all the elements. The importance of this factor cannot be emphasized enough.

But why, at the peak of the energy curve, do we find perfect electron spin alignment (magnetism) in iron, nickel and cobalt? By reading this paper you will find the reason for this is that these elements, high on the energy curve, are more **in phase** with the **surroundings** than the rest of the elements.

What our *Dark Age* science has totally missed is that we do have this **certain** *average* spin *misalignment* of all the electrons in our **surroundings** up to the Hubble limit and this **definite** *average* spin *misalignment* of these electrons in our **surroundings** is of the utmost importance; without this **certain** *average* electron spin *misalignment*, there would be **NO NATURAL LAWS**.

This **definite** *average* spin *misalignment* factor seems to approach a constant with a paucity of **surroundings** but also, like the speed of light, changes appreciably with acceleration and/or an increase of mass in the **surroundings**.

We begin to see the reason we must have this and general relativity too once it is realized that each electron must

maintain a specified spacetime relationship to all the other electrons in its **surroundings**. Remember, if Dr. Milo Wolff is correct then each electron is a **scalar**, standing wave created by all the other standing wave electrons in its **surroundings**. A certain spacetime relationship between all these standing waves must be remaining the same; if it was not then they could not continue to exist as standing waves.

So if things are really set up this way then we should expect a *limit* to the speed of light, shouldn't we? And we do find that limit plus we find the speed of light being a constant in a vacuum; these two important things seem to imply that Milo Wolff might be correct about his electron **scalar**, standing wave hypothesis.

Not only must we consider the aforementioned electron spin *misalignment* factor but a **definite** *average* spin *misalignment*, of quarks and stars, seems to be of the utmost importance for the existence of our **NATURAL LAWS** as well; that is what makes this entire paper **well worth reading**.

I do believe this is the best true story I've ever been able to tell — and if you've taken time to try to understand it — it ends with a bang!

From **Britannica 2009 DVD** "**Gödel's proof** first appeared in an article in the *Monatshefte für Mathematik und Physik*, vol. 38 (1931), on formally indeterminable propositions of

the Principia Mathematica of Alfred North Whitehead and Bertrand Russell."

Kurt **Gödel** proved that those who cannot see the *entire* universe might assume what they saw were universal laws; when instead these would really be nothing but *subset* rules, that applied only to their *subset* realm. Have we made this mistake? Are our *NATURAL LAWS* merely *subset gauge* rules, similar to those *subset gauge* rules used in quantum mechanics?

Schrödinger's Universe turns that seemingly remote possibility into a high probability. This is why Milo's book is so important. It really changes everything we previously thought was true!

If Milo is right – and I'm betting he is – then this turns out to be a *phase related universe*, in which everything has a certain *phase relationship* to its *surroundings*. Future super-computers will someday express all of our *NATURAL LAWS* in the simple terms of nothing but *phase relationships*.

This **new concept** of Milo Wolff's shows us that gravity, magnetism, charge and in fact all the forces along with space and time are all nothing but simple *phase relationships* with the *surroundings*.

Yes, this is totally ironic – *to what we are now being taught* – but yet absolutely true!

This paper gives you a glimpse into this **new concept** that future scientists will someday be using.

This **new concept** *also shows us that we do indeed have quantum gravity*. We can now precisely see what produces each quantum unit of gravitational attraction. Not only that but now we can see exactly why the gravitational force of a black hole can be felt even though no light can escape from that same black hole.

You will not only understand this but if you diligently read through all of this paper then even more things about this universe will make far more sense and you will also see where this new knowledge solves the riddle of the strong force and shows why it seems to act the way it does. This, in itself, is truly amazing.

I've worked in electronics all my life and know that **phase** is one of the most important elements when working with frequencies. What's difficult for me to believe, is that some of my quantum theorist peers — *by mistakenly rejecting the concepts of Nobel prize winner Niels Bohr* — have thereby eliminated the most important microcosm **phase** indicator from the **standard model**.

Yes, this is hard to believe — but this is what is happening!

And this has undoubtedly caused one of the main

weaknesses in the **standard model**!

A Britannica 2009 DVD quote: "The **standard model** has proved a highly successful framework for predicting the interactions of quarks and leptons with great accuracy. Yet it has a number of **weaknesses** that lead physicists to search for a **more complete** theory of subatomic particles and their interactions."

Merely add the needed Ampère-Bohr **phase** indicator and *Mach's principle* to the **standard model** and you get the **more complete** theory everyone is looking for!

Once this is done, you will see if you read on that *Schrödinger's Universe* will give you the **why** for the **symmetries** of everything in the **standard model**.

The reason for this is simple: Electric motors, stars, galaxies and even electrons, all spin and behave in relation to the **same phase rules** where there is a **binding** type attraction when both elements are **in phase** and more of a **repulsion** the more **out of phase** they are to each other.

In this frequency world of **Schrödinger**, we then see **why** the electron's spin/orbital frequencies are a separate **gauge** from the quark's — *much higher frequency* — spin/orbital frequencies, in today's quantum world.

From the Britannica 2009 DVD "**Dirac, P.A.M.:** English

theoretical physicist who was one of the founders of quantum mechanics and quantum electrodynamics. **Dirac** is most famous for his 1928 relativistic quantum theory of the electron and his prediction of the existence of antiparticles. In 1933 he shared the Nobel Prize for Physics with the Austrian physicist **Erwin Schrödinger**."

We cannot see into the spacetime realm (**gauge**) of the electron at all; however, we can learn its **gauge** rules. Quantum theory is built solely on our observances of tiny individual pieces of energy (**quanta**) that are either created or absorbed when mass-energy balances in the electron's spacetime realm have changed. This is all that realm (**gauge**) lets us see of it. From this, we know the electron "**sees**" itself and acts far differently from what we see is happening in our spacetime realm. The electron appears to "**see**" itself as both a wave type resonance and a sort of spherical spinning particle. Niels Bohr won the Nobel Prize for showing us how this **particle-orbit** aspect of it caused the various light colors. A bit later, **P. A. M. Dirac** showed us the **spin** fine structure of the electron.

Pardon my improper use of "**see**" for the electron but I believe it paints the best picture. We see both space and time in the electron's realm more highly compressed than our time and space. We see time and space in the quark's realm (another very different — *higher frequency* — **gauge**) even more compressed from the electron's. Events in the microcosm

happen much, much faster than events in our realm here; just as events in the macrocosm seem to happen slower than they do for us here on earth. These are **all gauge theory** road signs we can no longer ignore!

From the **Britannica 2009 DVD** - "**Gauge Theory**: class of quantum field theory, a mathematical theory involving both quantum mechanics and Einstein's special theory of relativity that is commonly used to describe subatomic particles and their associated wave fields."

Niels **Bohr** won the Nobel Prize for seeing electrons as spinning, spherical particles on orbits. I know that some have relegated that idea of **Bohr's** to the dim and distant past and **Bohr's** orbits are now being seen by some as a wave function orbital cloud with **Bohr's motion** missing. This is a mistake! I'll agree that the wave function orbital is there but so is **Bohr's motion**. You had better apply that old **Bohr** concept again to see how **phase** enters the picture. You will then see exactly how all this works.

Having said that, I must also add the caveat: You must understand exactly what **motion** is and the spin/orbit frequency parameters inside of which it must remain; for this, read on.

One of the absolute proofs that **Bohr's** orbital **motion** actually exists in the microcosm is that the sigma bond is stronger than the pi bond. How can this exist unless there is

real orbital motion there? It has to be that the two spin up, spin down sigma bound electrons keep spinning in the same plane — *producing the sigma bond over a far longer length of time* — than the polar pi bond that is only a short but repetitious bond whenever those two electrons, having the same spin, happen to pass directly over each other. So **Bohr's** orbital **motion** must be there.

We get the right answers by using both this concept of **motion**, used by **Niels Bohr** and the concept of *Mach's principle*, regardless of their diminution among many of my present peers.

From **Britannica 2009 DVD "Niels Henrik David Bohr:** Danish physicist who was the first to apply the quantum theory, which restricts the energy of a system to certain discrete values, to the problem of atomic and molecular structure. For this work he received the Nobel Prize for Physics in 1922."

The movement away from the way **Bohr** saw it, may seem correct but if you entirely forget *relative motion* and the orbiting, spinning particle that **Bohr** saw then you really lose sight of what's going on in a big way *because you lose the extremely important concept of phase*. You **must** also understand that these things are acting as both particles in **motion** and resonances depending on which **gauge** (*spacetime realm*) the observer is in. You must look at these

things **both** ways. So in science too, you get better depth perception if you use **both** eyes to see. **Bohr** got the Nobel Prize for seeing electrons as planetary objects on orbits.

*You'll see how important **phase** is later. Remember this is a **Schrödinger** frequency universe and with frequencies, **phase** is of the utmost importance.*

Phase isn't that complicated either. Do some thinking: If this universe is a sea of waves, as Doctor Milo Wolff is telling us, then when similar entities are seen as **traveling together on parallel paths**, in respect to the **surroundings**, then the more **in phase** they must become to each other compared to the surroundings.

It's this **phase comparison** to the **surroundings** that is so vitally important here! You'll see this too as you read on.

It's essentially the same importance as the **phase comparison** of the armature of a motor with its **surrounding** field windings. However, this is not being seen at all in these *Dark Ages* of science where *Mach's principle* (**surroundings**) is given little more than lip service.

James Clerk Maxwell even cited the **surrounding** field windings in a motor as evidence of the certainty of *Mach's principle*!

You'll discover, herein, that centrifugal force is an **in phase**

reaction with the **surroundings** and this also is *Mach's principle*.

At the time I write this, there are no computers capable of showing us all the **phase** aspects of electrons and/or quarks along with the **surroundings**, so the only **phase** picture you can get today, is by observing these particles using Bohr's motion along with the relative motion laws Ampere himself gave us.

This puts you far ahead of your science peers who know **phase** is of importance but have fewer tools at their disposal to see the **phase** picture in its entirety with the **surroundings**.

To see this yourself, merely view **phase** as associated with **motion** similar to the way both Bohr and **Ampère** did. The correct method to view **phase**, this way, was given to us by the *relative motion* laws of **Ampère**. <http://www.amperefitz.com/lawrm.htm>
(Click link.)

From **Britannica 2009 DVD "Andre M. Ampère: French physicist who founded and named the science of electrodynamics, now known as electromagnetism. Ampère was a prodigy who mastered all mathematics then extant by the time he was 12 years old."**

The big argument is about seeing the microcosm as Bohr, Mach and **Ampère** saw it or as some in modern quantum theory see it. I'm not saying Bohr's entire concepts are right.

What I am saying, is that Bohr, by using **motion**, the way he did, was automatically taking various aspects of **phase** and the **surroundings** into consideration. This is fairly easy to see using the laws of **Andre M. Ampère**. [*Ampere's Laws*](#)

Milo Wolff has proven **surroundings** cause inertia so **surroundings** must be considered. But this is not being done at all in modern quantum theory. Even though the Bohr view may not seem quite up to date, you can see the **phase** aspect and thus see the big picture using his view, along with **Ampère's** and Mach's, in this **Schrödinger type universe**.

You can not see the big picture using the present **standard model** quantum theory view that totally discounts the importance of both **phase** and the **surroundings** (*Mach's principle*).

And adding **phase** plus a few minor **surroundings** concept changes to the **standard model** will indeed give us this more complete theory that the **Britannica** mentions.

To understand what's really going on, we need Richard P. Feynman's skepticism of official wisdom — *because the experts certainly don't have the answer yet* — and more of a Feynman quantum-mechanical type explanation of the microcosm, so don't make a wrong turn here! Even globally many of our top people turn out to be wrong, **as we've seen in the financial world recently**. So in this pursuit of knowledge, the next

paragraph gives even quantum theorists an important bit of reasoning:

If you completely discard the concept of **motion** in the microcosm then you also discard the only common link to both the microcosm and the macrocosm — *both of which contain 99.9999% empty space and show evidence of orbit and spin* — and thus also discard any hope of a solution to the problem Einstein spent his entire life trying to solve.

A quote from the **Britannica 2009 DVD** "**Light**: Since Einstein's work, the **speed of light** is considered a fundamental constant of nature. Its significance is far broader than its role in describing a property of electromagnetic waves. It serves as the single **limiting** velocity in the universe, being an upper bound to the propagation speed of signals and to the speeds of all material particles."

You will learn, in this paper, why nothing built from electrons can go faster than the **speed of light**.

Do we really know what speed or **motion** is? If you answer yes then I must ask, "Why is there a **speed of light limit** to **motion**?" If you can't answer that then I have to assume you don't know the full answer as to what **motion** really is. So we must first fully understand what **motion** is, in this **Schrödinger** frequency world, rather than totally ruling out the concept of **motion** in the microcosm, which many of my peers have done.

Quantum theory is built upon a foundation of units of angular momentum and spin angular momentum that can only be caused by **motion**. Some quantum theorists have swept Bohr's **motion** under the rug simply because they couldn't see it in the microcosm.

If the evidence is there, then the thing that causes that evidence is there!

You will see, herein, the reasons why we see **motion** as being limited to the speed of light and why we cannot see **motion** in the microcosm.

The reason **motion** can't be seen in the microcosm is that its frequency is far higher than the frequency parameters limiting your **spacetime realm** (**gauge**). If you could possibly exist in the electron's realm — *which is impossible* — then you would indeed see **motion** therein somewhat similar to the motion you see now in this lower frequency **spacetime realm** here.

This may seem like heresy to some but I can assure everyone that future scientists, along with future super-computers, will someday unanimously return to the **Ampère concept of relative motion** and the **Bohr concept of spins and orbits** along with giving **Mach's principle** (**surroundings**) its true value, which is more than the simple lip service it's getting today.

The *Dark Ages* science of today, *believed now by vast multitudes*, that discounts these **three** important concepts, of **Ampère**, **Bohr** and **Mach**, will most assuredly vanish as completely as the ancient Egyptian religion of Amun, *once also believed by vast multitudes*, has completely vanished.

Niels Bohr used **motion** and thereby showed us **why** we get colors but only for the monoatomic hydrogen and helium atoms; his method failed, in accuracy, for the larger atoms that had altogether different numbers of electrons in the **surroundings**. So his method is only an approximation but it did definitely point out to us **why** the colors were there.

Ampère's Laws, that also use **motion**, are an approximation too — *until we get super-computers that can work out the surroundings* — but the important thing is that Ampère's concept retains the '**same basic rules**' in all the various **gauges** (*spacetime realms*) of quantum theory whereas the rules we are now using in these various **gauges** do **not**.

Ampère's Laws stay the same in all **gauges** as they do in our realm here. This Ampère-Bohr concept is showing you something brand new, for the first time: Ampère's Laws are giving us — *the first pictorial ever of* — a unification of **gauges** (*spacetime realms*).

With **AC** (*alternating current*), **phase** is extremely important whatever the frequency. And the rules for **phase** do not change with either higher or lower frequencies. Ampère's Laws are essentially **phase** rules that also do not change

with the various higher or lower *gauge* frequencies.

Thus Ampère's Laws finally have given us a *gauge* theory in which all the forces have a common origin and in which we have gauge invariance and which will, in the future, be related by better mathematical symmetries when better computers are available to satisfactorily work out the necessary frequency *surroundings*. To improve the **standard model** immensely, simply re-insert the original Bohr spin-orbit motion, which clearly shows you the important **phase** relationship that causes all the forces. Thus all the forces stem from the same source. And this is unification!

In addition, folks, this includes unifying the gravitational force *gauge* (*spacetime realm*) with the rest as well. *To see this, merely keep reading!*

Not only does Niels Bohr's concept show us why we have colors but the Ampère-Bohr concept together shows us more about what sigma and pi chemical bonding are specifically: If we look at the electron the way Niels Bohr did then there is no mistaking the fact that ***a sigma bond is an equatorial bond that is always between a spin up and a spin down electron, which are spinning in the same equatorial plane.*** Keep this fact about a ***sigma bond*** – *binding energy* – firmly in your mind.

From the **Britannica 2009 DVD** "**Sigma Bond**: in chemistry, a mechanism by which two atoms are held together as the result of the forces operating between them and a pair of electrons regarded as shared by them."

You will discover herein that of utmost relevance is the fact that ***sigma bonds*** are extremely important not only in

equating **binding energy** to mass lost ($E=mc^2$) but also in the photon energy transfers themselves!

From the **Britannica 2009 DVD** "**binding energy**: The total mass of the bound particles is **less** than the sum of the masses of the separate particles by an amount equivalent (as expressed in Einstein's mass-energy equation) [$E=mc^2$] to the **binding energy**."

As the **Britannica** states, scientists know that **binding energy** equates to mass lost or $E=mc^2$. You will see herein that if this is fully integrated with what Milo Wolff has proven then you get far more answers than this *Dark Ages* science view now gives you by itself.

And this is what I hope to present to you here.

The following is probably the first accurate presentation anywhere of what a photon really is:

A photon of energy is derived from the release of binding energy between a spin up-spin down electron pair. **Only** a spin up and spin down electron, spinning in the same spin plane, having both orbitals of the same size and configuration -- on different atoms -- can create a **sigma** bond between them. A **quantum chunk** of energy is released as this **sigma** bond is severed, resulting in reduced orbital size of the electron emitting the energy and causing the emission of light energy from the opposite spin electron that now receives the **quantum chunk** of energy released from the severed **sigma** bond ($E=mc^2$).

As I read Wolff's book it was plain to see that Einstein was

correct in 1954 when he said, "*I consider it quite possible that physics cannot be based on the field concept, i.e., on continuous structures. In that case, nothing remains of my entire castle in the air, gravitation theory included, [and of] the rest of modern physics.*"

Einstein was right: Physics cannot be based on the **field** concept unless it is realized that fields, like **motion**, must be restricted to certain spin/orbit frequency parameters. Future science will not be based on fields! Physics must be based on individual quanta (spin/orbit orientations), which when all added up simply *resemble* a field. In this new **scalar** frequency universe of Wolff and **Schrödinger**, the field is *never* a **continuous structure**: It's always a structure with absolute spin/orbit frequency limits of a particular entity; and this new knowledge gives us the reason why we have the various **gauges**, and different rules for each of them, in quantum mechanics. **For instance**: the **QED** (Quantum ElectroDynamics) **gauge** is limited to the spin/orbit frequency range of the electron and the **QCD** (Quantum ChromoDynamics) **gauge** is limited to the much higher spin/orbit frequency range of the quarks. Math and rules for these two **gauges** are entirely different.

Even though a multitude of quanta resemble a field, a quantum and a field are entirely different. So field rules and math are used only where a multitude of quantum exchanges take place.

You cannot analyze an individual quantum energy exchange, where an orbit or spin has changed, using field rules and math.

For controllable fusion power you are going to have to look at certain individual spin alignment orientations that are mandatory to permit fusion. You must forget fields while searching for controllable fusion power!

Ampère gave us a far better overall concept than the field. You will clearly see this too as we proceed. He gave us a '**continuous rule structure**' that works, *the same way*, in every different spin/orbit frequency gauge but it was overlooked and dismissed. Now we can see it should never have been because this Ampère-Bohr concept is the approximation that Dirac predicted we would someday use to make this universe understandable. Ampère's Laws should always be used as the '**overall set of rules**' that work, *the same way*, in every limited bandwidth field in this – *perhaps infinite* – frequency universe of **Schrödinger's**.

In the early 1800s, Ampère first explained electromagnetism using the concept of *relative motion*; later **Faraday** and **Maxwell** explained it using the field concept. Even before I received my First Class Radio Telephone License, I saw Ampère's *relative motion* concept gave me a far better and simpler picture, of what was really going on, than **Faraday's**

field did.

From the **Britannica 2009 DVD** "**Maxwell, James Clerk**: The concept of electromagnetic radiation originated with **Maxwell**, and his field equations, based on Michael **Faraday's** observations of the electric and magnetic lines of force, paved the way for Einstein's special theory of relativity, which established the equivalence of mass and energy."

In this ***Universe of Schrödinger's*** we see that any field will have **bandwidth characteristics**: it will have frequency parameters, which cannot be exceeded. You can not accurately portray a field unless the frequency parameters are specified. Note: #11 in <http://www.Ampèrefitz.com/FitzUSR.htm>. #11. **The more accuracy you want, the more you must narrow the range of frequencies involved.** Also, *the greater the frequency range you view, the less accuracy you will have (with present math).* (Feynman taught us this one.) Quantum scientists know this one as the rule: "**Before you quantize you must fix the gauge.**" ([**fix the gauge**] Specify the *gauge* frequency bandwidth.) <http://www.Ampèrefitz.com/quantize.htm>

Believe it or not but we are already, by using the standard model, actually **fixing** one spin/orbit frequency **gauge** for the quark; and **fixing** another entirely different lower spin/orbit frequency **gauge** for the electron and **fixing** an even lower different spin/orbit frequency **gauge** — *our NATURAL LAWS* — for us here on earth. This clarifies what Einstein said because these are clearly **not continuous structures!** They are separate

spin/orbit frequency **gauge** structures where, inside of each, the *spacetime interval* remains the same. However, the spacetime interval of one is **not** the same as the spacetime interval of a higher or lower frequency **gauge**. These different **gauges** all have different spacetime intervals! *This is why we cannot see motion in the microcosm.* These different **gauge** areas are linked together only by certain weaker harmonic frequencies: A good example of this harmonic linking is with gravity and light. This is why gravity bends light.

Einstein was right in 1954: these **gauge** areas (*fields or spacetime realms*) are **not continuous structures**. They all have entirely different spacetime intervals! That's why they are seen as different **gauges** in the standard model.

But let's move on:

We have, as part of the standard model, Quantum ElectroDynamics:

QED uses what is called the *square of the amplitude*. This correctly determines the **spin up - spin down** electron pairs that are in the correct position and lined up exactly right, having the correct *impedance (both electron orbitals must match in size)* to transfer energy, in a certain path, to and from certain points involved. Time is considered and so is space and also must be the fact that *a very minute portion* of the closest sides of both the emitting and receiving electrons

involved, in a quantum energy transfer, will sense that they are both tangent to parallel lines and moving in the same direction at the same speed. What the *square of the amplitude* tells us is that phase is critical. You'll see more about this and *minimum phase* a bit later.

When you have plenty of time, you can better understand this *square of the amplitude* quantum of energy transfer, if you listen to the **Feynman** lectures. <http://www.vega.org.uk/series/lectures/feynman/index.php>

From Britannica 2009 DVD "**Richard Phillips Feynman:** American theoretical physicist who was widely regarded as the most brilliant, influential, and iconoclastic figure in his field in the post-World War II era."

It's also extremely important that you read this very short part of Nobel prize winner **Richard P. Feynman's QED**: <http://www.rbduncan.com/feynm1.htm> Notice how momentous this concept of motion is for unification! This makes a great deal of sense when you look at what Ampère found over a hundred years earlier.

I was reading the final chapter of *Schrödinger's Universe* where Milo Wolff asked, "**What is the origin of space?**"

Here is a *quote* from the *Britannica 1997 CD* telling about Einstein's tensor math which "*led him to an essentially unique tensor equation for the law of gravitation, in which gravitation emerged not as a force but as a manifestation of*

the curvature of spacetime."

If I may be so bold as to tell you the answer to what space and time really are, then here it is:

As you see in the above *Britannica* quote, there is **no** such thing as **force** in the tensor math of **General Relativity**. What you actually get — *greatly simplifying things* — is more spacetime, than *average*, where **repulsive force** exists between two objects. In addition, there is less spacetime, than *average*, existing between two gravitational objects that have an **attractive** force between them.

Saul Perlmutter has shown, as in **GR**, that if repulsive force is more spacetime than *average* then we get Einstein's *cosmological constant* (exact opposite repulsive force of gravity) and gravity becomes a bi-polar force like all the other invisible forces.

This bi-polar aspect also exists in all the fundamental forces *fundamental invisible forces* giving us our **mistaken notion** of having North or South poles for magnetism and + or - for charge. **Mistaken notion?** Yes!

*** important ***

Quoting the *Britannica 2009 DVD* "**Phase**: when comparing the **phases** of two or more periodic motions, such as waves,

the motions are said to be in **phase** when corresponding points reach maximum or minimum displacements simultaneously. If the crests of two waves pass the same point or line at the same time, then they are in **phase** for that position; however, if the crest of one and the trough of the other pass at the same time, the **phase** angles differ by 180° , or π radians, and the waves are said to be out of **phase** (by 180° in this case)."

In this Wolff-**Schrödinger** frequency universe, all forces are nothing but **phase** relationships:

Here's the real reason for magnetism and also sigma and pi chemical bonding (charge): Two electrons, *with the same spin on the same spin axis, polar attraction*, magnetically/chemically attract when both entire spins are **in phase** and, **in magnetism**, this polar attraction is strong because both entire electrons are spinning **in phase** with each other. Their entire spin frequencies are **in phase**. The **equatorial side to side magnetic attraction** of a **spin up with a spin down** electron is a weaker attraction – *the same as the side to side attraction of two reversed pole magnets is a weaker attraction* – because only the closest sides, of the electrons causing this magnetic phenomenon, are **in phase**.

Chemical bonding (charge) is no different. However in chemical bonding, these magnetic binding strengths are reversed with sigma and pi bondings: Even though pi

bonding — *same spin, same spin axis, polar attraction* — should be the more powerful bond, it is not because it is a repetitious but only very short periodic, polar positioning — *many times involving a **spin shift*** — while a sigma bond — **spin up with a spin down** electron — is a steady equatorial bond over a much longer constant time period; thus it becomes the stronger bond of the two. **Of course, this is viewing things as Ampère and Nobel Laureate Niels Bohr saw them.** This Ampère-Bohr concept shows you all the fundamental invisible forces are caused this same way by **phase** relationships!

You won't see this correct view, of **phase, at all, looking from the accepted *Dark Ages* present science view. But using this motion seen by Bohr gives you a better, enhanced view of the important bosons — *photons and gluons* — and then you see the correct aspect of **phase** in this frequency world.**

You cannot use both field and **relative motion** (**phase**) concepts at the same time but to understand how this universe works, you most certainly must know how to use **both** concepts. Again, use **both** eyes to see.

Remember, the **phase** situation is what is causing the forces so you cannot use **relative motion** (this new **phase** concept) along with charge or gravity or any of the other fields. Use either concept by itself but **not** both concepts at the same

time!

In other words, when you are using *relative motion* (this new *phase* concept) then simply forget about plus and minus charge or gravity or any field, for that matter.

See: [Our Universe is a Quantum Computer!](#)

Remember, two electrons together with reversed spins, in the same equatorial plane (sigma bond) make the strongest chemical bond (*charge*) while, in magnetic materials – *it's the very opposite* – the same spin on the same spin axis, polar attraction in magnetism produces the strongest magnetic bond.

By purposely **not** viewing things as Niels Bohr, Mach and Ampère saw them, our modern quantum physicist experts may have made a major mistake – *maybe even worse than the modern financial experts* – and never noticed the reversal of strengths with magnetism and chemical bonding (*charge*) and thus could not see that magnetism was being caused by the same method as charge.

What we see as two entirely different things – *magnetism and charge* (respectively vector and scalar forces) – are both being caused, the same way, by the electron's spin and orbit motion. A certain portion of charge is also being caused by orbit-perturbation as I showed in 1966.

The scalar force of **charge**, in this atomic world of orbits and spins, comes about because of multitudes of vector forces that try to balance out — *minimum average phase* — but cannot do so exactly. **Charge** is the measure of unbalance that remains. *It is extremely important that you understand this!*

I've known this virtually my entire working life, as you can see by reading my first book published in 1966, and it has helped me immensely while troubleshooting in the electronic world.

As I've shown elsewhere in many places, composite vector forces — associated with free entities — can end up being seen as a scalar force and this is what is happening with charge.

Now you know something even the world's leading quantum theorists do not quite fully understand yet.

While magnetic force is obtained from electron spin frequency derived space; charge type force is obtained from the space derived by composite spin, **short, periodic bindings of the pi bond** and **orbit-perturbation** frequencies that cannot exactly balance.

Using this Ampère-Bohr concept, you will finally see magnetism, charge and indeed all the forces as being constructed exactly the same way.

*But in these **Dark Ages** of science today this correct type of **phase indicator motion** has been removed. Thus no one sees all the forces being constructed exactly the same way.*

The **Britannica 1997 CD** says, "In QED, the electromagnetic

interactions of charged particles are described through the emission and subsequent absorption of massless **photons**, best known as the "particles" of light; such interactions are not possible between uncharged, electrically neutral particles. The **strong force** is observed to behave in a similar way . . ."

In the *standard model*, both **photons** and **strong force** gluons are thus classified as **boson** quantum exchange particles.

But beware, because this **boson** exchange system — *if not seen correctly as a sigma bond* — can blind you: You may lose sight of this universe everlastingly making an attempt to **better balance toward neutral** where both spins and orbits are all in different directions and **not concentrated in a single direction**.

Magnetism and charge — *too many electron spins/orbits in one direction* — are, therefore, both unbalanced spin-orbit conditions; the more the unbalance, the greater the force. **Magnetism is the unbalance as a vector force and charge is a similar composite unbalance seen as a scalar force**. This universe always seeks to establish a balanced — *average out of phase situation* — relationship between everything. It does this via *minimum phase* sigma and pi bonding (binding) shifts.

This Ampère-Bohr concept shows us that both magnetism and charge come about because of **relative motion** (*really a*

phase relationship). It's all phase relationships, which are easiest seen as *relative motion* because we seem to understand **motion** better than phase.

Another reason it's easiest seen — *even by scientists* — as *relative motion* today is because we need more complete frequency rules along with the necessary super-computers before we can accurately view it as phase relationships. So for now simply view it as *relative motion*. Again, use **both** eyes as you look into this world of science.

All of our *NATURAL LAWS* stem from in phase and out of phase items *with the surroundings giving an average out of phase conditioning*.

Therefore, you can simplify force: See force as more spacetime, than *average*, where **repulsive force** exists and less spacetime, than *average*, where an **attractive** force exists, similar to **GR**.

Thus, the tensor math of **GR** shows you exactly what the origin of space is: It's telling us essentially that spacetime and force are, in a way, equivalent. Isn't this similar to mass and energy being equivalent in $E=mc^2$?

Space is nothing more than the "*average* force field" between surrounding entities while force is the same as in **GR**: force is the difference — *either more or less* — of this "*average* field" between certain separate entities. As we proceed, you

will see that this concept of **quanta** is absolutely necessary to completely understand both space and force.

In other words, space is the "*average out of phase* amount" while force is the same as in **GR**: force is the **difference** — *either more or less* — of this "*average out of phase* amount" between certain separate entities.

Thus we have a different type of space for the electron as we have for the higher frequency quark. This, believe it or not, is the reason for c^2 and the apparent acceleration we find with the *principle of equivalence*. More about all this later, so keep reading.

As noted astronomer Tom Van Flandern once stated, "You cannot square a speed." But here it is nonetheless, the speed of light squared, c^2 .

What's the full reason this quantity c^2 (speed of light squared) appears in our math? That's a good question and a good bit of what this paper is all about.

I'll give one reason now, and this is that certain *frequencies* in the quark realm are the **square** — *a harmonic* — of similar *frequencies* in the realm of the electron.

Tom Van Flandern and I discussed the impossibility of squaring a speed in our spacetime realm. But in this — *Wolff-Schrödinger frequency universe* — our spacetime realm is

mostly the orbital frequency of the electron.

Even I was slow to realize that Tom Van Flandern was absolutely correct and that the quantity c^2 itself was telling us it could definitely **not** emanate in our spacetime realm of the electron; therefore it is being generated in the much higher quark frequency realm.

It's plain to see that c is a *phase* ratio of the electron's spin frequency to its main scalar frequency that cannot be exceeded and c^2 is a *phase* ratio of a quark spin frequency to its main scalar frequency that cannot be exceeded. **Both can also be visualized as speeds at which these respective systems are actually being created.** These are therefore maximum speeds for those respective *gauges* or spacetime realms. These respective *gauges* balance out at these maximum speeds as well.

In fact all speeds — *in our spacetime realm* — can be visualized as *phase* ratios of the electron's spin frequency to its main scalar frequency. Someday future super-computers will view it this way too.

Einstein noted: "Gravity is a wave." Consequently, it has a certain frequency. This is the hidden secret of the origin of our *NATURAL LAWS* where each of the fundamental forces is in a different frequency band. Space also comes in different frequencies as well. This gives us **four** distinct, different *gauges (frequency spacetime realms)*. Now we not only see

the reason for the **gauge** rules of quantum mechanics but we see it's somewhat similar to — *a different frequency band acts as a different dimension* — what the string theorists have been telling us. The highest of these *frequency spacetime realms* gives us the vast majority of the gravitational force, as you will soon see. *The lowest galaxy spin frequency gives a different type gravity too but you will have to read my other papers to see that. Gravity has the widest bandwidth of all the forces but that's elsewhere so as to keep this paper as short as possible.*

You will only realize **why** we have 4 distinct different **gauges** (*frequency spacetime realms of forces*) when you use the Ampère-Bohr concept using **both** eyes and seeing this *modified standard model*. You won't see this if you limit your vision by remaining only in the *Dark Ages* of science using the present *unmodified standard model*.

Once you see all this then you can solve the paradox of "action at a distance" where the past *seemingly* becomes involved both in obtaining light from distant stars and in the Feynman diagrams used in quantum mechanics.

Let's begin a tiny lesson in quantum mechanics by looking at an electron and its anti-particle the positron.

In this **Schrödinger Universe**, of frequency bands, the electron is entirely constructed from two distinct frequencies: its main **scalar** resonant frequency and its **spin** frequency.

Fulbright Scholar Milo Wolff has mathematically proven these two distinct frequency resonances.

The positron also is built up of the same two: its main **scalar** frequency and its **spin** frequency.

However, both the positron's main scalar and spin frequencies are 180 degrees *out of phase* with both the electron's main **scalar** and **spin** frequencies.

Therefore, when these two standing wave entities meet, they establish a *minimum phase* relationship and the wave crests of one go into the wave troughs of the other and both electron and positron are completely annihilated.

This is one of the startling facts of quantum theory. Quantum physicists know it happens. Now you may know more than they do because Milo Wolff's discovery has shown you exactly why it happens.

The people who have read my words on <http://www.rbduncan.com/> and <http://www.Ampèrefitz.com> know that you cannot even begin to understand this universe until you know exactly what space and time are. Our minds seem to be equating the main **scalar** frequency of the electron as a clock that mainly determines what we call **time**. We sense the **spin** frequency mainly determining **force** and **space**. (*We see the spin of the electron causing the magnetic force.*) Also, by reading, what you see

in the above links, you will see what force the spin of the quark causes to even distant quarks. Also read: [1/18/2006 The Vector Scalar relationship between force, space and time.](#)

By reading what is in the above links you will also know what we see is an average time and an average space. Both time and space are really made up of numerous **quanta** bits, the same as energy. This concept of an average time and space, made up of numerous **quanta** bits of time and space — *a great many billions of separate, different out of phase relationships between every single thing in this universe* — is extremely important to the correct understanding of both time and space. I'll explain this further as we proceed.

Each electron repels its nearest neighbor by a certain amount of force, the same as each star repels its nearest neighbor by a certain amount of force. Let's call these quanta too because they come in chunks like energy quanta. It is these individual repulsive force chunks (quanta) added up and averaged that give us our illusion of space. And it's the same with time as well.

View these electrons as Niels Bohr did, as spinning spheres, even though we know they are a complicated **Schrödinger** type resonance.

Think of entire electrons as never being involved in **spacetime** light transfers. In fact, only **very minute portions** of the closest sides of the emitting and receiving electrons —

one is **spin up** and the other **spin down** – are involved. And if these **closest sides** "*see*" themselves as close in *impedance* (both on the same size orbital) and moving at the **same direction** at the **same frequency** then they will also "*see*" themselves inside the same **Minkowski** light cone. Thus, they will be able to transfer this **spacetime** quantum of light energy from one electron to the other.

From the **Britannica 2009 DVD** "**Minkowski, Herman: His idea of combining the three dimensions of physical space with that of time into a four-dimensional "Minkowski space"-spacetime-laid the mathematical foundations for Albert Einstein's special theory of relativity.**"

Sigma chemical bonding is a proven fact. It must always be seen as a **spacetime binding force** between a **spin up** and a **spin down** electron whose **very minute portions** of their **closest sides** are going in the same direction. Light energy is also exchanged, exactly the same way, as a **spacetime binding force**: It's nothing more than a long distance sigma bond that ends up transferring a quantum of light energy. This **spacetime** transfer is between a **spin up** and a **spin down** electron where **very minute portions** of their **closest sides** are always going in the same direction.

One additional thing is *very* important and this is that **energy only diminishes with the square of the distance when multiple numbers of electrons are involved. Why?**

Because it is these numbers involved, in the transfer, that fall off with the square of the distance. Between only two electrons, this quantum of sigma binding energy – *a sigma bond* – remains at the same strength out to the Hubble limit of distance. Now you see **why** a quantum of light energy does not diminish in intensity with distance: This is another well-established quantum theory principle. In fact, this is the keystone of quantum mechanics.

Now, here's what Niels Bohr taught us:

From the [Britannica 2009 DVD](#) "Spectral lines are produced by transitions of electrons within atoms or ions. As the electrons move closer to or farther from the nucleus of an atom (or of an ion), energy in the form of light (or other radiation) is emitted or absorbed."

For instance:

If a **quantum** of **violet** light is given up by a star to your eye then on that star, in a certain time period, an electron that was originally far from its nucleus, dropped to one of the closest orbitals of its nucleus. While in that same time period (*standard model explanation*) an electron in your eye emitted a **quantum** of **violet** light.

As the electron on the star dropped, the electron in your eye emitted a **quantum** of light. *This is the way it is being explained in the standard model.*

If a **quantum** of **red** light is given up by a star to your eye then on that star, in that same time period, an electron dropped about half the distance to its nucleus. While in that same time period an electron in your eye emitted a **quantum** of **red** light.

Again, as the star's electron went down to a lower orbit level, your eye electron emitted a **quantum** of light energy. (*The standard model view.*)

Thus appears, in **quantum** theory, the concept of a **boson** with the **photon** acting as a **boson quantum** exchange particle. A **quantum** of energy on that star was simply shifted or exchanged with your eye via a **photon** (**boson**).

From the **Britannica 2009 DVD** "**quantum**: the magnitude of all the **quanta** emitted or absorbed is the same in both energy and momentum. These particle-like packets of light are called **photons**, a term also applicable to **quanta** of other forms of electromagnetic energy such as X rays and gamma rays."

Photons are classed as **boson quantum** exchange particles. Remember, in these **quantum** exchanges, the same magnitude of energy emitted is also absorbed.

From the **Britannica 2009 DVD** "**quantum mechanics**: The probability of a transition between one atomic stationary

state and some other state can be calculated with the aid of the time-dependent Schrödinger equation. For example, an atom may change spontaneously from one state to another state with less energy, emitting the difference in energy as a **photon** with a frequency given by the Bohr relation."

Let's look at how a **photon** supposedly works in the *standard model*:

If batter **blue** hits the ball twice as much as batter **red** *in the same time period* then batter **blue** will expend twice the energy as batter **red**.

It's the same with light: as **violet** light being twice the frequency of **red** light has twice the energy in each **quantum** of light.

But the time period with all of these **quantum** exchanges seems to be associated with Planck's constant (h). So if the batter hits the ball twice as much, this gives twice the energy. Since there are twice the swings back and forth with **violet** light as there are with **red**, in that same time period, then a **quantum** of **violet** light comes out with twice the energy of a **quantum** of **red** light.

However, all of this is well known to **quantum** theory physicists.

Now we come to something not as well known to all:

You must realize that the sigma type close bondings — *of your electrons here* — also occur with distant electrons as far off as the Hubble limit; not only that but these far distant bondings are at the same strength as close bondings. They must be the same strength because the quantum of light emitted from the star was the same strength as your eye received; this is an agreed upon, quantum theory fact.

The quantum of light from the star to your eye, called a photon (**boson**) in the *standard model*, is being caused by this spin binding shift. However, this particular binding shift is between the two distant electrons that are free to go **down** & **up** their orbits and vibrate as they do so, respectively **causing** & **receiving** these light or heat or radio waves. Thus these bubble chamber tracks are caused by real binding shifts of a spin up with a distant spin down electron.

This universe is forever trying to balance via *in phase* spin attractions: where this happens the *standard model* gives us a **boson**, which we now see are really these binding shifts between distant electrons.

Since this *standard model* photon has no mass then it has to be considered nothing more than a simple binding shift or binding exchange between that star and your eye? A simple binding shift would better account for the recoil effect noted in Feynman diagrams. And a binding shift causing other binding shifts, or emanating from other binding shifts, would

better account for the various bubble chamber tracks.

Even the magnetic type **spin** attraction has a sort of Bose-Einstein condensate element to it because space has disappeared (condensed) between the *in phase portions* of the two magnetically bound electrons.

A Quote from the **Britannica 2009 DVD** tells us, "**Bosons** include mesons (e.g., pions and kaons), nuclei of even mass number (e.g., helium-4), and the particles required to embody the fields of quantum field theory (e.g., photons and gluons). **Bosons** differ significantly from a group of subatomic particles known as **fermions** in that there is no limit to the number that can occupy the same quantum state."

Also from the **Britannica 2009 DVD** "**quantum mechanics:** The symmetry of the wave function for identical particles is closely related to the spin of the particles. In quantum field theory (see Quantum electrodynamics), it can be shown that particles with half-integral spin ($1/2$, $3/2$, etc.) have antisymmetric wave functions. They are called **fermions** after the Italian-born physicist Enrico Fermi. Examples of **fermions** are electrons, protons, and neutrons, all of which have spin $1/2$. Particles with zero or integral spin (e.g., mesons, photons) have **symmetric** wave functions and are called **bosons** after the Indian mathematician and physicist Satyendra Nath Bose, who first applied the ideas of symmetry to photons in 1924-25."

So how do all these **bosons** really differ from **fermions**?

Bosons are more **symmetric** (*more in phase*): they have maximized their (close range) binding energy. **Fermions** haven't!

In a **Boson**, spins and orbits will be structured to minimize binding with the **surroundings** (mass creation) and instead maximize binding to internal close units instead. **Bosons** will be the maximum **in phase** with internal close entities and the minimum **in phase** with distant **surroundings**. This is the important Ampère **phase** picture that must be added to the *standard model*.

Simply — *using the Ampère Bohr concept* — view the **very minute portions** of the **closest sides of any** two spin, sigma bound entities as obeying Bose-Einstein statistics because portions of their spins are now **in phase**.

Or view the two entire sigma bound — *now in phase* — entities as a single entity with their binding having **boson** characteristics.

You increase, immensely, the value of the **standard model** by doing this!

You also greatly simplify things once you use the Ampère-Bohr concept and see that quarks can attract via their spin the same as electrons do in magnetism/charge. This binding force — *of electrons and quarks* — depends on the

frequency of the spin. And these frequencies change with mass as we know light, heat and radio frequencies change with mass increase or decrease.

Once this is seen then not only can a magnetic type spin binding be visualized as a **boson** type Ampère **in phase** attraction but why we see this concentration of the strong force in an area the size of the proton or neutron is explained as well with Ampère's Laws, however, that will be more toward the end of this paper. So keep reading.

So summarizing — *all types of force* — we have the following:

Average out of phase, of all the various entities, is what we sense as **space** and **time**.

More out of phase than *average* is a repulsive force.

More in phase than *average* is an attractive force.

As we learned previously from the **Britannica**, binding energy is always equal to the mass lost via $E=mc^2$.

Therefore solid state pioneer Carter Mead must be right and we surely must be still in the *Dark Ages* of science and **all** these universities must be *asleep at the switch* if **none** of these universities have ever published why mass is lost via $E=mc^2$.

*** important ***

Therefore, it's obvious why we have the mass loss via $E=mc^2$ and you also perfectly understand *Mach's principle* (surroundings) as well:

Each electron that changes far off binding (with distant surroundings) **to close binding, changes** a quantum of *inertial mass* to *energy* in the amount of $h\nu$ or Planck's constant (h) times radiation frequency.

This is it in a nutshell! It's all nothing but tiny quantum sized binding changes that do not change binding strength with distance. Electrons can shift sigma bindings from distant to close electrons or vice versa. Quarks can also shift a form of sigma binding to other quarks as well.

A pi bonding shift alone, is not possible between the electrons in your eye and the far off surroundings. Simple light, heat and radio radiation, directly from the star to your eye can only be a sigma bonding shift (h) or a pi bonding shift combined with a sigma bonding shift. The reason that you cannot have a pi bond unless you also have a sigma bond, is explained perfectly by *Ampère's Laws* but not by any other laws.

The reason that you have spin alignment (magnetism) with iron, nickel and cobalt, which are at the peak of the energy curve, is that there is more spin binding with the surroundings — more **far off binding** — with those elements

that lie on the peak of the energy curve. The more **far off binding** you have then the more likely you will have spin alignment (magnetism). A preponderance of close binding actually has a tendency to prevent spin alignment (magnetism).

The *specific timing* of h – *angular momentum derived from orbital change* emanates unmistakably from predominant cycles in the quark realm. This is the reason for SU(2) Symmetry and **not** that the spin of the electron is different from the spin of a top, which is the prevalent belief today. Wheeler and Feynman essentially showed us we cannot see motion in another *gauge (frequency spacetime realm)*. You can only see motion in your own spacetime realm. You only can see the **effects of motion** in other spacetime realms.

*The truth of this leaves the symmetries of the **standard model** fully intact. But we do have to visualize the boson, particle concept a bit differently to see with both eyes and get better depth perception.*

* ** *

From Britannica 2009 DVD "**Mass**: in physics, quantitative measure of inertia, a fundamental property of all matter. It is, in effect, the resistance that a body of matter offers to a change in its speed or position upon the application of a force."

Mass is the measure of inertia. The reason we have inertial **mass**, is because of these far distant – *same strength* –

bindings with similar frequency entities in the **surroundings**. For gravity these quark to quark bindings are simply to objects closer than the quark to distant quark bindings in the **surroundings** that cause inertial mass.

Therefore it becomes crystal clear that these binding changes from far to close, *where energy is gained*, are the real reason for $E=mc^2$.

The majority of my science peers — *even though they know we have such a thing as centrifugal force* — are totally **blind** to this aspect of binding with the far distant **surroundings** (*Mach's principle*). This **blindness** remains in spite of the fact Berkeley discovered this in the 1700s. **I heartily thank Dr. Milo Wolff for finally mathematically proving this beyond a shadow of a doubt.** For instance, an electron in your eye first gains inertial mass by binding with an electron on a distant star. Then **it turns this inertial mass into energy** by binding with another closer electron in your eye; thus giving your eye a quantum of light energy via a photon/binding shift.

This is very much like your car's spark plug where the coil is first connected to the battery but the spark is created when the battery *disconnects* from the coil the same as your eye gets the quantum of light when that first electron *disconnects* from the star.

In a prism the lowest light frequencies (**red**) are bent the least. The highest light frequencies (**violet** and ultra violet) are bent the most. It's the same with standing waves with the highest frequency spherical, scalar, standing waves being seen by us as smaller and lower frequency, spherical entities being seen by us as larger.

As you read on you will also see a necessary quantum effect with both space and time.

You see stars as being far away and their light as coming from the past. This is true and it is because the vast majority of the star's electrons are out of phase with your electrons. But that does **not** mean **all** of these **very minute portions** of the **closest sides** of those electrons are going to be out of phase with **all** the **very minute portions** of the **closest sides** of your electrons.

Quantum theory is trying to teach us all about this peculiar spacetime setup, we are in, but we are slow learners.

It is of little importance if an electron on the distant star is in the past and the electron in your eye is in the present. What really matters is that they have **opposite spins** and that a **very minute portion** of the **closest sides** of the electron in your eye and the one on the star both "**see**" each other in the correct alignment and *impedance (similar size orbit)*. They

also "*see*" their frequencies in the same phase sync so as to be on the same Minkowski light cone.

Only then can light energy be transmitted. See: [Ampere's Laws or Aufbau laws](#) and if you have time <http://www.rbduncan.com/theALaws.htm>.

Observing it this way, as an *in phase wormhole* through various bits of *average out of phase space quanta* chunks, you eliminate the necessity for aether, "*action at a distance*", time reversal and a lot of other nonsense.

Light goes through a vacuum!

There is absolutely nothing in a vacuum to transfer this light.

Understanding this shows you there is no such thing as aether nor is there any such thing even needed to transfer light.

However, you have to know *exactly* what space and time are to properly see this; thus knowing, that space is really the composition of *space quanta* bits, is extremely important! As **Einstein** said, "*Reality is merely an illusion, albeit a very persistent one.*"

From the **Britannica 2009 DVD** "**Einstein, Albert:** In the 19th century there were two pillars of physics: Newton's laws of motion and Maxwell's theory of light. Einstein was alone in realizing that they were in contradiction and that one of them must fall."

Einstein was correct: *Space and time are an illusion*. They are not what we *think* they are and you must understand exactly what gives us this space and time illusion before you can figure out this universe.

We are composed of electrons that are all resonating at a certain frequency. Believe it or not but we are nothing more than a good superheterodyne radio receiver that can not tune into the quark's frequency band (**gauge**) nor the lower electron's frequency (**gauge**) but does tune into an even lower frequency — *electron orbiting* — band giving us our space and time for that one particular frequency band (**gauge**) and we *think* we see all this space and time that our ancestors have written all about for thousands of years. However, since the Michaelson-Morley experiment, there have been insurmountable problems [Here are a few problems](#) with that old idea of space and time *unless* we see this is, in fact, a **Schrödinger Universe** and **space** and **time** are both *an illusion* caused, respectively, via phase differences in these **spin** and main **scalar** frequencies.

From the **Britannica 2009 DVD** "**Spacetime**: in physical science, single concept that recognizes the **union** of space and time, posited by Albert Einstein in the theories of relativity (1905, 1916)."

But these **spin** and main **scalar** frequencies are intertwined in a **union** and cannot really be separated because they are

the same as **space** and **time** which, as the **Britannica** states, are in **union** together and can not be separated even though we can, via this *illusion*, separate the two in our minds.

However the **union**, there are **phase** differences between these **spin** and main **scalar** frequencies.

Somehow our minds can differentiate these **phase** differences thus, via this *illusion*, separating the two, in our minds, into **space** and **time**.

The more *out of phase* the principle **scalar** frequencies of two electrons are, then the more *time* that we will see existing between them.

Yes, the average time between an electron on that star and one in your eye, we see as very much *out of phase* — *separated by much time* — but not a **very minute portion** of the closest sides of the two, **opposite spinning**, light transferring electrons. These closest sides are exactly *in phase* with each other and "*see*" themselves existing at the *same time* and on the same Minkowski light cone.

What our minds sense as **time** and **space** are nothing more than both phase relationships in this **scalar** frequency and **spin** frequency universe of **Schrödinger**.

The closer the main **scalar** frequencies are, in phase, then the closer we see the items are to each other in **time**.

The same with **spin** frequencies: if no phase difference exists, between *very minute portions* of the **spin** frequencies of similar entities, then our minds see them in the **same space**.

They can now be considered in the **same space** because now with similar portions of their spins in phase, those *very minute portions* now obey Bose-Einstein statistics.

As we deal with **scalar** resonances, they will give us a more *exact* concept of what space and time actually are. You can see why we must have the laws of relativity and why space and time must change with speed and/or mass.

Space and time are things that are constantly being produced by out of phase resonances. This is simply the way things are set up in this universe and this average space and time set up between everything remains basically the same.

Nevertheless, a minor portion of it can be different from the *average* or you wouldn't have gravity or any other type force. So small portions of it can be different from the *average* and are different from the *average*: thus giving you the various forces. Only the mean or *average* setup remains the same. The tensor math of general relativity is virtual proof it works like this.

You can't remove the average space and time between

everything; however, a tiny bit (quantum) of space and time can be removed via a *minimum phase* binding (bonding) shift. Moreover, a tiny bit is removed, from a *very minute portion* of the closest sides of two electrons with **opposite spins** in the same equatorial spin plane. That's exactly why we have sigma bonding along with heat and light and the radio wave spectrum.

This is how sigma bonding is produced and how light and heat are transferred. You must think of each quantum of energy like Einstein's photon: it's a direct transfer or a *minimum phase* binding shift between two electrons, whose *very minute portions* "*see*" themselves both in the same place at the same time. It's as simple as that. And these *very minute portions* are doing this because now they are both **in phase** and obeying Bose-Einstein statistics.

While two electrons with reversed spins can be on the same orbital, the *very minute portions* of those same two electrons can go one step further in the Bose-Einstein concept and actually be seen — *in this Schrödinger Universe* — as being in the same space at the same time.

Space itself is being caused via the *average* of all these spins that are not spinning on parallel paths and are thus spinning **out of phase** with their neighbors. (This is also Ampère's law.)

Now, as you ponder all this, you can see that **phase** is the real reason behind the Pauli exclusion principle and Bose-Einstein statistics.

We can no longer think of light, traveling from place to place, in a waveform. It does **not** travel, in a transverse manner, like water waves on top of water nor, in a longitudinal way, as sound waves through air nor even like high or low frequency electrical waves through wires. We know it is a quantum transfer. Scientists of the future, who will learn more about space and time than today's scientists know, will see each quantum transfer of light between electrons not as a wave but as Einstein's photon, or as a **direct transfer** or binding shift that sets up a vibration at the light frequency.

These scalar, standing wave entities are actual waveforms. And light is a waveform while in your eye but please do **not** think of it as a wave while each quantum of light is being transferred through a vacuum. You must **not** see each quantum of light as a wave! You must also see it as Einstein's photon. See it as a **direct transfer** or *minimum phase* binding shift through the vacuum because it acts first as a sigma bond, which is a **binding force**. This long distance sigma bond between the two **opposite spinning electrons** is the vital element that effects the quantum energy transfer. In the future, it will be seen as a **Schrödinger** resonance

reaction. So I guess Viv Pope is right, after all, about preaching this fact to us and that the speed of light (c) should be looked upon as something else besides a speed.

As this energy transfer of light, from a distant star in the past, comes to your eye, in the present, then something else important happens as well in this **Universe of Schrödinger's**. There is then a balance reaction in the **total average** phase shift of the electrons in that past to the **total average** phase of the scalar frequency, of all the electrons, in your present time.

Using sunlight, we are pulling enormous energy out of the past, although it's only about 8 minutes in the past; however, the universe balances this out as well with a simple *average* phase change.

It does get a bit more complicated because we have two major clocks: the electron's main scalar frequency and the quark's.

In addition, we also have those two spin frequencies giving us force and space.

The quark's frequencies are much higher than the electron's. This gives it an entirely different frequency band or spacetime realm (*gauge*) from the electron's. Our spacetime realm — where h or Planck's constant is our high frequency limit — is a

lower harmonic frequency than both the quark and electron. To see the big picture you absolutely must understand the quantum concept of **gauges** or spacetime realms. Once you do see this **Universe of Schrödinger's**, then you can see the big picture and thus see how it all works.

Now we return once again to **Gödel's proof**: that those who cannot see the *entire* universe might assume what they saw were universal laws or our **NATURAL LAWS**; when instead these would really be nothing but *subset gauge* rules, that applied only to our *subset* realm.

Surprisingly our **NATURAL LAWS** do have **gauge** limits as well: The orbital frequency realm of the electron or where we use Planck's constant or ***h*** being our high frequency limit; and the spin frequencies of the galaxies in the macrocosm being much lower than our low frequency limit because our gravitational laws cease working correctly in those galaxies: We see the spiral arms of spiral galaxies as going faster than their escape velocity and this is impossible. *This, by the way, is a far better explanation for the spiral arms paradox than dark matter, which no one seems to be able to find as much as needed for a total dark matter explanation.*

Schrödinger's Universe shows us that **Mach's principle** (same frequency **surroundings**) is not only necessary for inertial mass, but gravity and all the other invisible forces as well. Add to this what Van Flandern [*Van Flandern*](#) is telling us

about the *speed* of gravity: [4/10/2005 Speed of Gravity is \$9 \times 10^{16}\$ meters per second.](#)
 Then you see exactly what c^2 really is and **why** we must have the *principle of equivalence* or **why both** gravity and its exact opposite force, *Einstein's cosmological constant*, must also be seen by us as associated with the element of acceleration. I guess Saul Perlmutter [Saul Perlmutter](#) was the first to see this. This means we are in a steady state universe because this accelerated expansion is only apparent just as the acceleration of 32 ft per second², caused by gravity is also only apparent. See [9/11/2005 Where does \$C^2\$ come from?](#)

A quote from the **Britannica 2009 DVD**: "If one speaks in Newtonian terms, the *cosmological constant* could be interpreted as a repulsive force of **unknown origin** that could exactly balance the attraction of gravitation of all the matter in Einstein's closed universe and keep it from moving."

This repulsive force — *opposite from gravity* — between all the stars and galaxies, consistent with *Einstein's cosmological constant* would be seen as an apparent accelerating, expanding universe. This is consistent with what Milo Wolff has found because for scalar standing waves to exist, we must be in a steady state universe. Essentially both **Saul Perlmutter** and Milo Wolff have provided the necessary proof that we **are** in a steady state universe. The acceleration and expansion are only apparent just as the acceleration of 32 ft per second² associated with gravity is only apparent.

Einstein's cosmological constant is giving us this apparent accelerated, expanding universe. No longer is it of **unknown origin** because now we know the involvement of c^2 in producing this — *out of phase* — repulsive force.

Quoting from the **Britannica 2009 DVD** "The Supernova Cosmology Project, headed by **Saul Perlmutter** of the Lawrence Berkeley National Laboratory in California, reported on measurements of the apparent brightnesses and red shifts of 42 Type Ia supernovas. . . . not only is the rate of expansion of the universe not decelerating, but it also appears to be **accelerating** slightly."

Einstein died before **Saul Perlmutter's** group discovered this **acceleration**. If Einstein would have known about the **acceleration** then he would have known he did not blunder in 1917 and he would have told everyone that if one could not discern the acceleration of $32 \text{ ft per second}^2$ from gravity (*principle of equivalence*) then one also could not discern his *cosmological constant* — *equal but opposite force of gravity repelling all the stars and galaxies from each other* — from an apparent accelerating, expanding universe.

Now let's return to these *minimum phase* spin binding frequencies that will change with mass and we see the *mass* of the three quarks inside a proton or neutron is *so great* that it changes the spin frequency of these quarks so much that

three close spinning quarks must attract one another differently, via spin-orbit resonance (*charge*), than when they are further from each other and separated by the radius of a proton or neutron where their combined mass is less and their spins are again at different frequencies to one another.

As quarks orbit they also precess and it is this precession that changes and gives more or less attraction to the other, either close or far distant, quarks. Quarks, like electrons must *impedance (having orbits of similar size)* match to bind: They can only bind with other quarks that have the same translational mass. As a bicycle wheel spins faster this translational mass greatly increases, *with the far distant surroundings*, giving greater centrifugal force with greater speed thus pulling quarks further from the center of the nucleus. This is also why you stay up better on your bicycle the faster the wheels spin. **What is holding you up on your bicycle is an unseen far distant part of the quark strong force!** This is why quarks are constantly moving toward and away from the center of the nucleus. Thus we get the *appearance* of **asymptotic freedom**.

From Britannica 2009 DVD "When the quarks are close together, they exchange fewer gluons, and the force is weaker. Only at infinitely close distances are quarks free, an effect known as **asymptotic freedom**. For their discovery of this effect, Gross, Wilczek, and Politzer were awarded the 2004 Nobel Prize for Physics."

The three different quark spin frequencies, in protons and neutrons must all be higher fundamental harmonics of the electron's spin frequency. These frequencies must be closer to distant quark frequencies when these quarks are separated furthest from the center of the nucleus (*getting more pull from distant quarks*).

So not only do quarks bind with electrons via this harmonic binding — *reason gravity bends light and why electrons are attracted to the nucleus* — but quarks also spin bind with other distant quarks in the universe to cause gravity, inertia and centrifugal force.

Since we have nothing to sense this, it looks as if the strong force is totally contained inside the nucleus but these are simple sigma bonds of spinning quarks that behave exactly like sigma bonds of spinning electrons obeying [*Ampère's Laws*](#).

The color strong force (a sigma bond) derived from the quark spin is being picked up outside the nucleus by electrons. If it wasn't then how would we know quarks have $2/3$ and $1/3$ charge?

So the strong force is **not** totally contained within the neutron or proton; this proves strong force leakage. It's this same quark color force that will destroy a flywheel if it is spun fast enough because when you spin something then this imparts a translational motion to the quarks so that now sections of

their orbits must *impedance* match with quarks on the distant stars that have this greater mass as well. If you spin the flywheel fast enough then it is this color strong force of the quarks that finally destroys the flywheel by pulling it apart. **It is the color strong force of the quarks, to distant quarks, that causes centrifugal force as well as gravity and inertia.**

So when you come right down to it, it's **phase**. And to see **phase** best, go the Niels Bohr **motion** route.

See: [3/18/2005 "Why the Strong Force acts the way it does."](#)

So Niels Bohr was right on the mark after all! Orbitals should be seen as orbits too. Look at it with **both** eyes!

Therefore, the strong force is **not** entirely contained inside the proton and neutron after all! It behaves exactly like all the other forces! You can't see this using our *Dark Ages* present science. But you certainly can see it using Ampère's Laws along with the Bohr concept.

A **Britannica DVD 2009** quote: ". . . there is as yet no experimental evidence for the **Higgs boson**, which would be a direct indication for the existence of the **Higgs field**."

Higgs boson? Inertial mass is caused via sigma bindings. These bindings will all be different for different entities at different spin frequencies. These bindings will be happening

in different **gauges**, so from our perspective they will be happening at different speeds. Electrons will be binding at the speed of light and quarks at a much faster speed that we will **detect** as c^2 . This is not exactly the **Higgs field** but this is what is causing both inertial mass and gravitational force.

Gravity is really the color strong force of the quarks extending to distant quarks at a speed that in our spacetime realm will appear to us as c^2 . It's this **average out of phase** quark to far distant quark produced space — *thus produced between all the stars and galaxies* — that we recognize as an apparent acceleration. It's too high a frequency for us to see it simply as space.

This agrees with what astronomers are being taught in all the major universities, that gravity acts closer to instantaneously (c^2), the way Newton said and not at the much slower speed of light (c) like Einstein supposed. Van Flandern said he was taught this at Yale. Evidently the top astronomers know this universe can not be stable if gravity acts at the slower speed of light.

So what happens if electrons appear to bind at the speed of c and much higher frequency quarks appear to bind at the much higher speed of **our space times our space** or what we see as c^2 ?

Newton, Van Flandern and the astronomers are sending us this message: gravity — **in phase** quark to remote quark binding — is

acting far faster than the speed of light. We must therefore conclude that the opposite *out of phase* quark spin *average* space creation — *out of phase* quark to distant quark repelling — is acting far faster, than what we recognize as space, at the space creation rate of c^2 or **our space times our space** or what we see as apparent acceleration.

Since magnetic attraction can be explained by an in phase, spin sigma binding, then so can the quark color force be explained via an in phase, spin sigma type quark binding. Gravity and inertia are being caused via this sigma type quark to distant quark binding the same as the in phase, spin sigma type quark binding inside the neutron causes the strong force (color force) between the three close range quarks that build protons and neutrons.

Ampère's Laws, therefore, work the same way for quarks as they do for electrons and stars.

The spin bindings of all entities with their same frequency **surroundings** cause inertial mass. Milo Wolff has proven this. So various spin frequencies of various entities are causing mass in this **Universe of Schrödinger's**.

The **Britannica 2009 DVD** says, ". . . Einstein expressed these ideas in his deceptively simple **principle of equivalence**, which is the basis of general relativity: on a local scale-meaning within a given system, without looking at other systems-it is impossible to distinguish between

physical effects due to gravity and those due to acceleration."

The *principle of equivalence* is the proof that the strong force of the quarks to distant quarks is this somewhat comparable field to the Higgs field that we are all looking for.

The *principle of equivalence* states that one can not discern the unreal but apparent acceleration of 32 ft per second² from gravity.

There's a message here:

Because Wheeler and Feynman have shown us that we cannot directly measure something outside of our spacetime realm but we can detect it.

Planck's constant or h (*electron orbiting frequency*) gives us the highest frequency limit where we can measure space directly. We cannot directly measure the space produced by these quark spins, because the frequency is too high and completely outside of our spacetime realm, but we can **detect** this quark produced space, that we see being produced at the rate of c^2 , as an apparent acceleration.

And the *principle of equivalence* is giving us this apparent acceleration as the proof of massive strong force leakage from within the atomic nucleus.

In other words, we cannot directly measure this extra space

that all these out of phase quarks are causing to distant quarks — *nor will we ever be able to directly measure it* — but we most certainly do **detect** it (**our space times our space**) as c^2 or apparent acceleration.

This is why we have the *principle of equivalence*.

Indirectly Dr. Milo Wolff has shown us that all scalar forces are really multitudes of vector forces. This is why the Higgs field is thought to be a scalar field. What we have instead is really a multitude of vector sigma binding forces — *with their same frequency surroundings* — that give us what we see as inertial mass.

Even so, the **standard model** is pretty close to what is really happening. All it needed was some tweaking with a few minor ***Schrödinger's Universe*** concept changes to give us a crystal clear insight into what's really going on.

All this may appear strange to those who remain in the *Dark Ages* of science. In this case, however, truth is stranger than the *Dark Ages* fiction.

Now — *if you've read all this* — you finally know why these things are happening.

Einstein was right; the system is understandable: It's really simple when you see how it all works and when you do see *exactly* how it works then you'll also see this is a true *Theory*

of Everything.

Now for the really important question:

Is A. Garrett Lisi's mathematical *Theory of Everything spherical* model really a model of Dr. Milo Wolff's *spherical*, scalar, standing wave resonance?

Perhaps it is. Better check this link out: <http://www.rbduncan.com/lisiimp.htm>

Yes my friends I'm very much afraid that, as well as in Galileo's age, the universities are all asleep at the switch on this one too.

The important thing to remember is the portion of this universe *that we notice* is composed of 4 spacetime realms: Each of these has an entirely different space and time (different spacetime interval).

1. The quark has the highest spin/orbit frequency spacetime realm.
2. The electron has a lower frequency spacetime realm than the quark.
3. Our spacetime realm is a lower frequency than the electron's realm.
4. The galactic spin/orbit frequency spacetime realm is even a lower frequency spacetime realm than ours.

In each of these realms entities will sense Ampere's laws, motion, inertia and 90 degree gyro torque. But these will be seen in other realms as something else: For

instance magnetism and charge stem from the above four things operating in the electron's realm.

Our gravity and inertia stem from these four things (Ampere's laws, motion, inertia and 90 degree gyro torque) operating in the quark's realm.

If you've read and understood all of this then you have a good understanding as to why everything behaves as it does.

Remember, this is a **Schrödinger frequency Universe**. We know the electron is affected by its lower orbital frequencies and the higher frequency quark nucleus. If these lower and higher harmonic frequencies also help determine that we see the electron as a *spherical* particle then we have reason to believe that we will also see A. Garrett Lisi's mathematical solution to unifying the 4 forces, of higher and lower frequencies, as a *spherical* model. And this is exactly what we do see indeed.

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OUR AMAZING RESONANT UNIVERSE

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Everyone seems to have missed the fact that both *the element of probability in quantum mechanics* and *Young's Double Slit Experiment* were pointing to a critical phase relationship and different spacetime realms. Once this is seen then the incomprehensibility of quantum theory completely disappears.

Quantum theorists are absolutely right forgetting Bohr and seeing everything as resonances in this **Schrödinger frequency-resonance universe** but we do not have the super-computers yet to give us even a fraction of all the perfect resonance answers to all of this. This is why, in the interim, I'm returning to Bohr.

I wish I would have published — *before Stephen Wolfram did* — the fact that you can use math to explain simple things — *such as I've done herein with $h\nu$* — but you need a model to explain complicated things. This Ampère-Bohr model, that I've been harping on since 1966, explains the entire universe better than anything presently available. As Einstein said, it's all an illusion. I agree; even motion is an illusion; even my Ampère-Bohr model is an illusion in this all frequency-resonance universe. But it's the **best model we**

have, so use it until we emerge from these *Dark Ages* of science, as Carter Mead calls them, with an accurate frequency model of *Ampère's Laws* and the super-computers needed to work out the **surroundings**.

See: [7/5/2005 Euclidean geometric motion](#) and if you have more time read [5/22/2005 A NEW Science Tool](#)

What is so incredible about this was that in 1966, while trouble shooting in the avionics section of Pan American Airlines, I discovered the first important *relative motion* part of this and published it in 1966-1967 [Fitzpatrick's First Book](#). There was a full page — page 29 — devoted only to my book in the Sunday Book Review Section of the New York Times, on June 18, 1967. Thousands of those books were in most of the universities of America not long after that too. I now know it's phase differences that make us see the *relative motion* aspect of it that I first noticed way back then in 1966. I hereby thank all the scientists in all the universities for not latching on to this *relative motion* concept way back then and allowing me the 40 plus years that I needed to invalidate all the arguments against *relative motion* — including the one Robert Dicke gave — and to work out this phase system that the universe uses.

The absolute proof of this will come as soon as it is

discovered that all binary stars of the same mass have opposite spins. See: [9/6/2005 Binary stars act exactly like electrons](#)

Spinning stars are acting more like fermions than we suspect: each individual star has more effective quark to quark binding with the black holes in the middle of all the galaxies — in the far away "fixed stars" — than it does with closer stars where there are no black holes. Therefore, with more far off binding than close binding, stars have fermion behavior.

This is why we have spectacular supernova explosions: at first a potential supernova star shrinks and not only gets denser but gets stronger too because this **internal** quark to quark translational binding is increasing causing the strength to increase while also shrinking the star. So this star is actually getting stronger and shrinking, via **internal** binding increase.

But the quark to **far distant surrounding** quark translational binding is now increasing as well giving the shrinking star far more mass.

Please remember, these quarks must impedance match before this translational binding can take place, so these supernova quarks are forced to find quarks with an equally high impedance match in the far off **surroundings** and these finally can only be found in the black holes; so while the supernova **internal** binding is increasing, at the same time its binding to the quarks in the **surrounding** universe is increasing too (giving it more mass). However, this mass increase is accompanied by the **surrounding** black holes in the universe trying to pull the star apart. In the end it is this tremendous black hole binding force in the **surrounding** universe that wins out and pulls the star apart in all different directions. A supernova doesn't blow apart; it actually gets pulled apart by all the black holes that are in the middle of all the galaxies in the **surrounding** universe.

Centrifugal force is a similar force but it is only a pull from the **surroundings** in one plane whereas with the supernova the pull from the **surroundings** is a **scalar** pull in all directions. It's hard to believe at this day and age that those asleep at the switch in our universities do not

even understand that centrifugal force is a pull from the **surroundings**. Berkeley understood this. Mach understood this and Einstein's first wife evidently understood this; whether Einstein really understood this will be up to future historians to decide.

Now we begin to see why elements, stars and galaxies tend to be a certain size. Every mass increase is also an increase in the inertial pull of the **surroundings** in all directions.

That's what mass is: mass is the inertial pull of the **surroundings** in all directions.

Life exists on earth because of supernova explosions. Life may end if we encounter a supernova explosion in our own galaxy too.

Anyway, we would not even be here were it not for all those black holes in the middle of all the galaxies **surrounding** us.

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Daniel P. **Fitzpatrick** Jr.

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