# Photons Protons and Quarks

## Hypotheses Contrary to the Standard Model of Particle Physics

Bruce A. Lutgen

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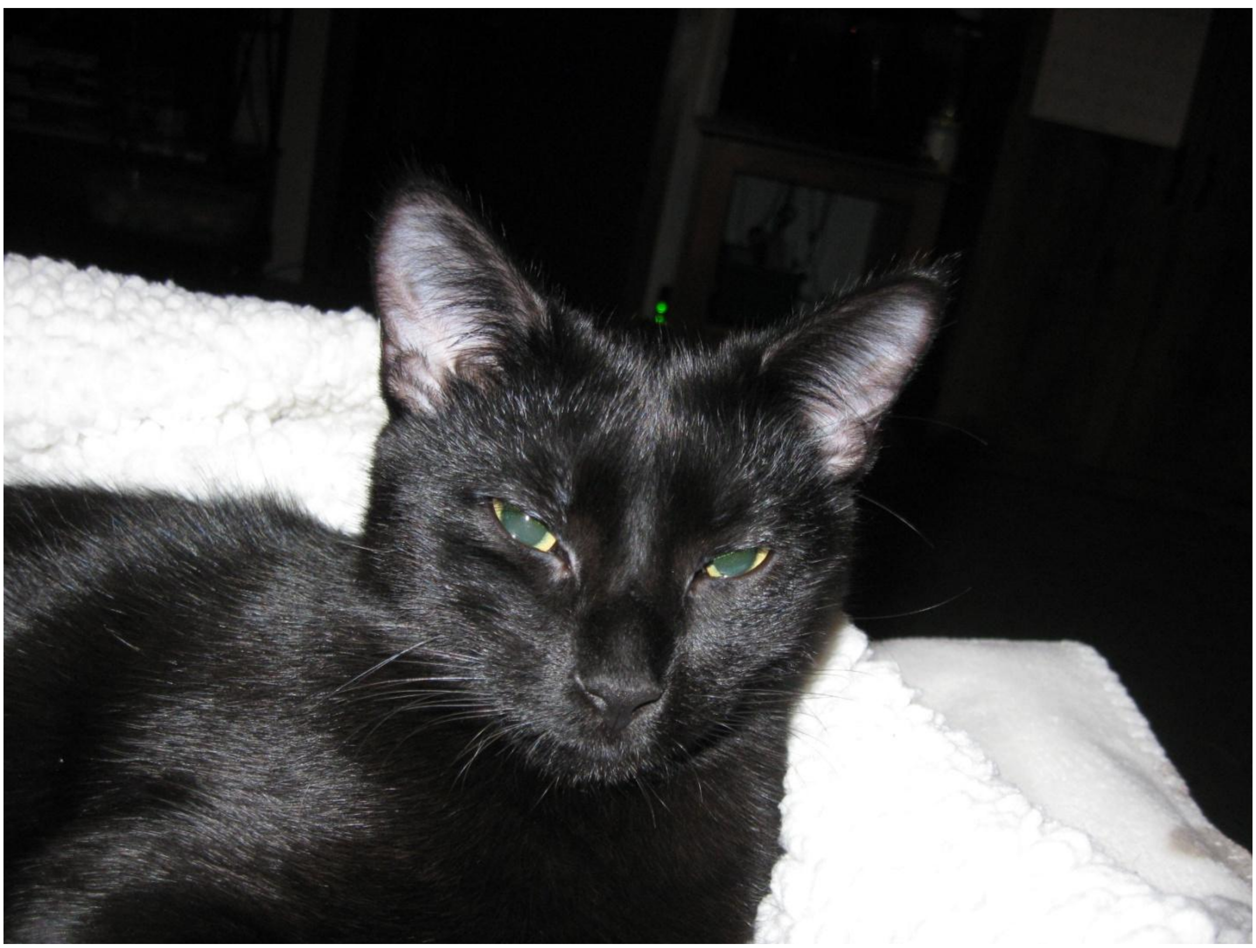

My name is Cat and I am disinclined to be a fan of Erwin Schrodinger.

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# *Introduction*

## Introduction

What is presented in the following pages is somewhat of a straightforward engineering approach to quantum particle physics. This approach is integrated to an extent with the considerable work done by those in the physics community. My work experiences primarily lie in the fields of industrial and mechanical engineering but, after receiving Richard Feynman's book *QED, The Strange Theory of Light and Matter* as a gift, I became intrigued with particle physics and the Standard Model. I have since informally expanded my study to include works by other noted authors in the field of physics.

I became aware of what I would call conundrums in what was being presented in the literature on quantum particle physics. My engineering approach to resolving these alleged conundrums is seemingly ideal (to me anyway), but then surely time and others will tell.

I firmly believe in crossing discipline boundaries in order to resolve vexing problems. I have successfully used this approach repeatedly throughout my career. Applying engineering knowledge and skill to attack conundrums within physics seems almost natural. With that, perhaps my hypotheses will prove useful in some small way.

B. A. Lutgen

# CHAPTER

# 1

# Conversion of Photons from Particles to Linked Waves

# Chapter 1

## Conversions of Photons from Particles to Linked Waves

In microphysics, how do photons behave like both waves and particles? It is called wave-particle duality. The wave-particle duality inference would appear to be counter intuitive. Are waves really a cluster of particles, as is often stated, yet like the waves that radiate in a disturbed pool of water as is often demonstrated? The answer to wave-particle duality may lie through the following proposed solid torus or possibly ellipsoid ringform field explanation, which is derived in part using classical physics. A solid torus or ellipsoid ringform hypothesis is contrary to string theory and at least to some extent accepted particle physics.

Is electromagnetic radiation made up of waves, particles or both? (Feynman, 1985) Some would say that such waves are no more than clusters of particles. I propose that photons, which make up electromagnetic radiation (Feynman, Leighton, Sands, 1989, Vol. 1) from gamma rays to extremely low frequency radio waves, can transition from particle-like to waveform when released from their parent electrons. That is to say, electromagnetic radiation defined as being comprised of particles may actually be in waveform through the particle's intrinsic field-altered shape followed by linking. This does not preclude the possibility that electromagnetic radiation could be a mix of true waves and unaltered particle-like photons especially since the transition from particle to waveform might not always be successful.

My hypothesis is the result of reverse engineering. Reverse engineering can have negative connotations but here, without having a pirated product to hands-on disassemble and physically measure, such an approach is in all probability appropriate. An imaginary free photon, as a wave, was tracked back to its parent electron. The hypothesis was then developed forward from that point.

### Ringform Defined as a Solid Torus or Possible Ellipsoid

Consider a photon, as an energy field, being essentially in the shape of a solid torus or ellipsoid before or just as it is released from its source electron. The photon, like its parent electron, is an energy field in the shape of the proposed ringform.

Electrons are the incubators of photons. Photons are released from electrons when the electrons lower in their orbit from around an atom's nucleus, with the photon often being described as a packet of energy. Electrons will not be discussed here in depth even though they are the architects of photons including so-called massive photons. It is being suggested that electrons are the basis of the ringform shape and that a photon will assume the shape of its parent. Note that this does seem to beg the question: is a photon, while it is still coupled to an electron, a separate entity that is somehow joined with the electron or is it simply a bit of the electron?

Within accepted schools of thought, photons are explained as being particles. Adding to that thinking, this proposal suggests that photons have a ring-like solid torus or possibly ellipsoid shape when in their normal orbiting position while an intrinsic part of an electron. That they are generally in a ringform or will assume ringform with an electromagnetically strong region that is continuously oriented towards the parent atom's nucleus. This results in an asymmetrical energy field. The strong electromagnetic region in the photon will continuously adjust position toward the atom's nucleus as necessary, while the photon is in range of the nucleus's influence.

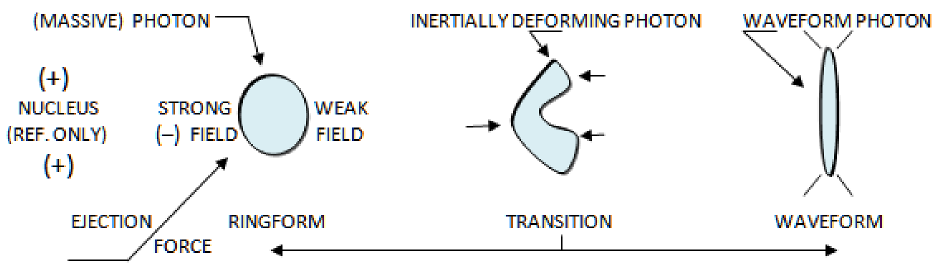
Diametrically opposed from the photon's electromagnetically strong region is a weak area. The assumption is that this electromagnetic weak region in the photon's field offers the means for the photon to change shape. It can change shape from what appears to be a particle into a monopole linear waveform when it is stripped from its electron by an energetic triggering event. When a photon is forcefully ejected from its electron, the inertial force resulting from the instantaneous angular acceleration results in the ring-shaped photon deforming or separating at its energy weak region to produce a linear waveform (Figure 1-1). In other words, the photon transitions from ringform to linear waveform. Fundamentally, the seemingly particle-like photon can be thought of as a closed curled wave. The monopole linear waveform will remain linear until or unless acted upon by some overriding external influence. If the possibility exists for a functional equivalent of the nucleus's strong force that holds the nucleus together, the free waveform photons will unite end to end as probability dictates. It is suggested that this will happen due to an equivalent strong force's apparent concentration at the monopole's ends. It is anticipated that this equivalent strong force will act in a way that is somewhat comparable to how magnetism aligns itself inside a bar magnet while appearing to concentrate at the bar's ends. In spite of a wave favorable length to radius ratio, individual waveform photons can still appear to be particle-like because of their overall micro size. It is also offered that the changing from ring to linear presentation will also work in reverse with deceleration as and if external forces influence the photons.

Photons are in ringform when they are with their parent electrons. Ringform photons will deform to form waves when subjected to impulse driven acceleration. It is therefore conceivable that the waves could return to ringform if subjected to an appropriately targeted energetic external influence.

Freed photons will form as waves by virtue of their fluid ability to change from ringform to waveform. Having wave-like length or essentially being ring (particle) like, the free likely massive photons energy level will remain the same except when acted on by an external force.

When ringform photons are deformed into electromagnetic monopole waves then the monopoles are expected to have the ability to join end to end with each other as opportunity allows.

Figure 1-1




NOTE: REPRESENTATIONS NOT TO SCALE. RIGID OUTLINES ARE FOR EMPHASIS ONLY.

# *CHAPTER*

# *2*

# *Cored Protons*

# Chapter 2

## Cored Protons

Protons and neutrons, known collectively as nucleons, are made up of quarks. More specifically, up and down quarks. Protons and neutrons when joined together become an atom's nucleus. Within particle physics, it has been said that gluons (gauge bosons) act as force mediators that work to hold the quarks together in the atom's nucleus. Contrary to this view, gluons may not be responsible for this attribute of atomic structure. It is being offered that electromagnetic and strong gravity-related forces are in fact responsible for holding the nucleus together as an assembly. Taking that concept even further, the gravity-related force, when radiating beyond the nucleus, will morph into something much weaker but more extensive in range.

What is being proposed is divergent from some of the teachings of current physics. With that, the hypothesis presents a different approach to atomic structure.

The premise is that, with electromagnetic cores surrounded by bi-polar outer electromagnetic fields, aided by gravity-like energy (ref. Part II of this chapter), protons are bound in close proximity to each other while capturing their electrons through differences in electromagnetic polarity. Protons through electrostatic and a gravity-like attraction also retain charge neutral neutrons.

According to the Standard Model, a quark is a type of elementary particle. A proton consists of two positive charge up quarks and one negative charge down quark and a neutron is made up of one up quark and two of the down quarks. The assumption here is that protons consist of an offset positive-charge fundamental energy core, one of the proton's up quarks, surrounded by a bi-polar energy field. The bi-polar field consists of the two remaining quarks that are conceivably oscillating and at frequencies differing from that of the core's field and possibly each other. The bi-polar field with its positive charge core in some ways resembles the structure of an egg with white and yoke components (Figure 2-1). The proton's core and bi-polar outer field are of differing characteristics because of their delegated types. Significantly, the two up quarks give the proton its outward net positive charged presentation.

Through appropriate alignment of positive to negative polarities, the protons will hold each other in close proximity while retaining their more distant attendant electrons in much the same way (Figure 2-2). Additional energy, assistive in keeping the nucleons together, is provided by the strong gravity-like force that is depicted in Part II of this chapter.

Neutrons as well are part of an atom's nuclear structure. It is also being hypothesized that the proton's negative pole charge functions in a way that that mimics what is referred to as electrostatic attraction, otherwise loosely known as static cling. Through this attraction, the proton's negative charge electrostatic region aids in holding charge neutral neutrons in place.

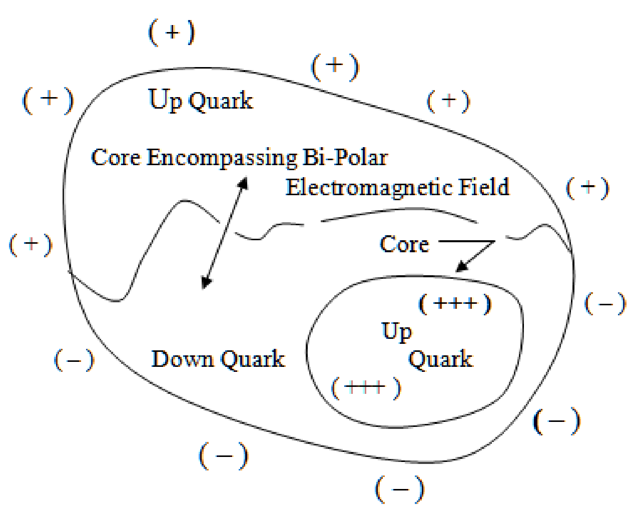
The nucleus moves as a grouping in synchronicity with any orbital motion of the electrons. This synchronization reduces the possibility of destructive shear forces between protons and electrons. A nucleus with more than one proton and neutron will result in a crystalline structural lattice. This lattice will change configuration three-dimensionally as the number of protons and neutrons varies.

How the positive-charge up quark core survives inside the bi-polar outer field, or the other way around, has not been fully rationalized. Conceivably the proposed core and bi-polar outer field, because of their fundamental differences, are immiscible. This suggests that the bi-polar field and positive-charge core are protected from reaching a ground state. For instance, opposing forces from like-magnetic poles working in conjunction with attractive electrostatic polarities might be considered as a means to keep the proton's core balanced, as a core.

Figure 2-1

Cored Proton

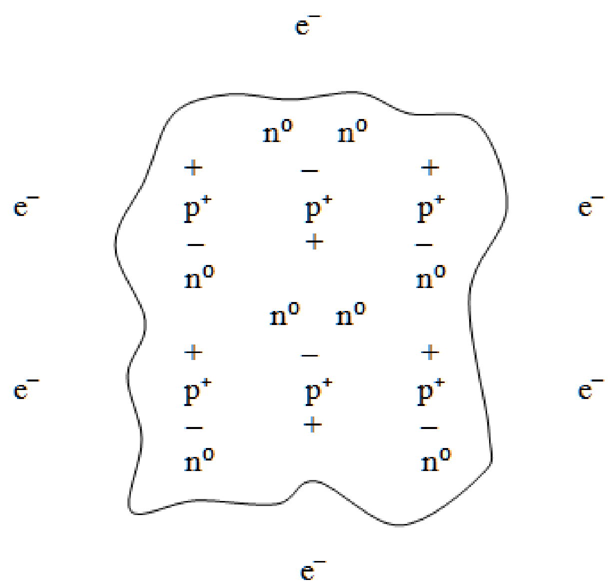
This two-dimensional illustration is not to scale. The charge symbols are illustrational of the positive and negative charge outer field. The rigid outlines are used only to demonstrate the separation between the up quark core and bi-polar-field quarks.



The protons consist of positive-charge electromagnetic cores surrounded by bi-polar electromagnetic fields. The positive-charge core, with another up quark, results in the nucleus presenting as being electrostatically positive externally, with a somewhat offset field strength. In this way, proton to proton to neutron and electron integrity is maintained (Figure 2-2).

Figure 2-2

Illustration of Carbon-14 Nucleus with Surrounding Electrons Not to Scale




Note: Other numbers of protons will result in an altered crystalline lattice.

Part II Chapter 2

The Strong Binding Forces between Nucleons

Analogous to the first law of thermodynamics, the strong gravity-like energy in adding force to the binding of protons to protons to neutrons (nucleons) takes place in something less than a totally closed system. This will lead to the ultimate conservation of energy. *This force exhibited between nucleons does not transfer between the nucleons but is expressed as a form of work.* The force is intrinsic and is compatible with electromagnetic energy, allowing them to coexist.

There are two distinct forces at work here. The first is polar electromagnetic. The second is a strong gravity-like force ($gl$). This gravity-like force is in the form of waves or fields and is non-polar in that it only attracts nucleons to each other (but does not repel). This energetic force is only effective very close in to the nucleons.

The constituents of a nucleus either are in direct contact with each other or are extremely close together: picture the boundaries of protons or neutrons as being indistinct (fuzzy). In this system, the two different but compatible forces increase in attractive strength by the inverse square (or higher) of the distance between nucleons. This results in the nucleons being held in tight proximity to each other.

$$\mathcal{E} + gl = \frac{F}{d^{\mathrm{n}}}$$

The energy required to separate nucleons from each other is in the MeV range. With the two complementary intrinsic forces, the gravity-like force being the stronger of the two, and the close-knit nucleons, the high energy needed to disrupt a nucleus is held true.

## Part III Chapter 2

Recalling from Part II, the nucleus's energy system is something less than totally closed. At short-range and close in to the binding regions between nucleons, the gravity-like energy level is exceptionally high. Tracking away from the closely bound nucleons, the gravity-like energy drops off dramatically while morphing into a very much weaker gravitational field but one that has long-range influence.

As the total mass of a macroscopic system increases so does the gravitational force to the point where, if enough mass is added, the gravitational force becomes readily quantifiable. In the microscopic world of nucleons, gravity or gravity-like forces cannot be directly measured. With this inability to directly measure such related forces, the subject will continue being open to discussion.

# CHAPTER

# 3

# Locking Fractional Charge Quarks

# Chapter 3

## Locking Fractional Charge Quarks

Fractional-charge up and down quarks make up an atom's protons. The existence of such quarks is well accepted. Despite enormous amounts of energy being expended in the effort, recalling from necessarily limited written resources, a proton has never been successfully broken apart into identifiable constituent quarks. How then is this inability to successfully break protons into observable individual quarks explained?

The so-called strong force is usually invoked when it comes to bonding micro particles. In the viXra.org paper posted under quantum mechanics (Lutgen B. A., *Cored Protons*, viXra Citation Number 1903.0513, 28-Mar-19), electromagnetic and gravity-like forces are discussed as the means for holding nucleons together.

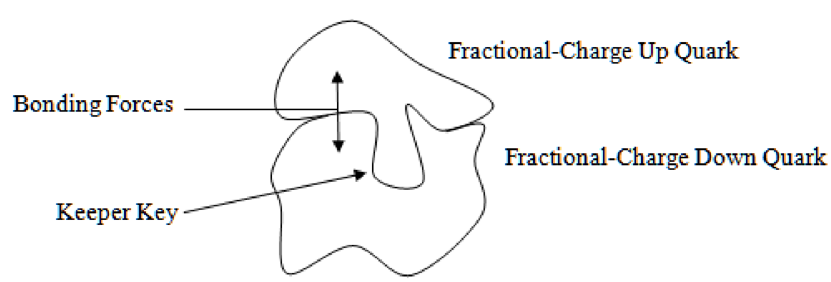
If electromagnetic and gravity-like (or other) forces are also responsible for holding quarks in close proximity or in direct contact with each other, such forces must achieve extraordinary energy levels in order to prevent an inescapable identifiable separation. It is therefore considered that such forces only provide assistance in holding the quarks together as a proton.

There is the possibility of a mechanism that might work to prevent the disassembly of the proton. Picture the up and down quarks keyed to each other by deforming in such a way that locks them together, essentially mechanically, while the total bonding area is increased (Figure 3-1).

Contrary to what is presented above and elsewhere, while hypothesizing even further, perhaps protons are not made up of individual quarks after all but are true to type single units that maintain zonal fractional charges within their configuration. These difficult or impossible to fracture lone units only appear to consist of separate entities in that they function like multiple quarks.

Figure 3-1

Not to scale. The exact shape of quarks is unknown. What is shown two dimensionally is illustrative only. There may well be more than one keeper type key per quark.



# CHAPTER

# 4

# Skirting Conundrums

# Chapter 4

## Skirting Conundrums

The study of quantum particle physics has been going on for a relatively long time. While not discounting in any way the work previously accomplished on the subject, particle physics appears to have come solidly into its own with the invention of the cyclotron by Ernest O. Lawrence around 1930. The cyclotron has since evolved into larger much more powerful particle accelerators culminating with the LHC (Large Hadron Collider). The purpose of the LHC is to drive high-energy streams of specific micro particles into each other in an attempt to fracture the particles into constituent components. (The cyclotron does not accelerate opposing streams of particles but accelerates only a single stream of micro particles. The accelerated particles are then deflected into or otherwise impact a fixed target.) The chase was and is on to reduce the innate particles, which make up all things considered matter, to their most fundamental forms. The question is have we gotten ahead of ourselves?

There are many named particles that include true particles, hypothetical particles, quasi particles and virtual particles. These particles are assigned to groups that are within what is called the Standard Model of particle physics. The Standard Model of particle physics is at the heart of quantum particle physics while covered under the umbrella of quantum mechanics. The hunt goes on for yet more particles to be named and assigned to some group. Some so-called particles appear unproven in that they were cultivated only to solve some conundrum or to confirm a particular mathematical hypothesis. A potential part of the alleged problem involving the appropriateness of what is being done is the forced interpretation of what is being observed experimentally.

Are some of the products of the various colliders' not true new particle but the result of less than head-on collisions? Are grazing hits or contaminated particle streams falsely producing what appear to be new particles? How many particles are misidentified noise from some source such as an electronic or electro-mechanical device that causes unrecognized interference with the various detecting apparatus? It is suggested that potential sources of interference, even though they are being looked for and considered, cannot be fully accounted for or eliminated.

The use of "free parameters" (arbitrary parameters) is also challenging. A number of free parameters are used in the current Standard Model in order to make it work. As the number of free parameters increases, serious questions develop about subject validity.

Instead of continuing to seek new quantum particles of potentially questionable lineage, perhaps those investigators in the world of physics should back up and work on previously but debatably solved issues.  Issues such as those that contain questions about the use of force carrier particles to ostensibly solve certain problems involved in defining the forces holding atomic structures together.  The contentions outlined herein only but reinforce suggestions made by others in that there is work to be done on refining the current Standard Model or that the model needs to be replaced by a new paradigm.  (Replacing the Standard Model with one of the string theory variants or a string theory collective currently appears unlikely.)

# CHAPTER

# 5

# Caught Between Philosophy and Theory

# Chapter 5

## Caught Between Philosophy and Theory

In the field of physics we fairly well know what fundamental interactions (forces) do but we cannot know what they are or where they come from:  caught between philosophy and theory.

Mathematics is a precise effective method of communication that is used in science as well as everyday life.  Beside mathematics being a means of communication, words are also an exacting means of communication.  Each of these means of communication relies on symbols for their existence.  Each of these means of relating information requires extensive study to be mastered and each of these is limited by true to type society-imposed rules of usage.  These conventions have been developed over the millennia and are so well accepted that they in a way tie our hands.  With that, there is the unresolved difficulty in defining fundamental interactions by what they are while using the only two tools at our disposal.

Fundamental interactions, as the name implies, are basic in form and ostensibly exist in a way that is foreign to us.  The fundamental interactions are vague in that they are seemingly physically dimensionless and rather ghost-like.  Fundamental interactions can imaginably cross space and time dimensions because of a curious fluidity*****.  Such forces might not have fixed boundaries but can abide by boundaries.  In quantum physics, fundamental interactions are there that cannot be seen or directly measured, such as the interactive forces between quarks or electrons and protons.  Since we draw a blank in attempting to describe what they are, the so-called fundamental interactions can only be defined by what they do.  (If you think about it, language is full of conundrums like this.)  Unfortunately this limitation is inherent within us.  Stated plainly, within our own limitations and the limitations of the communicative and descriptive tools we have at our disposal, it is likely that we will never be able to characterize such interactive forces outside of describing what they do.

We know what fundamental interactions do.  Their abilities have been well described and quantified.  We cannot say, with either mathematics or words, what such forces are.  With that, *it is suggested that we need to halt fruitlessly trying to define exactly what they are while refraining from inserting the physical (particle) equivalents of free parameters into our fundamental interaction thinking*.  Inserting such equivalents is tantamount to kicking the can down the road in that many new questions are then opened up.  Accepting the fundamental interactions for what they do, if not for what they are, can work well enough for us.

Dimensions beyond the one's we are familiar with in our everyday world are difficult for us to wrap our minds around. Indefinable fundamental interactions that reside within a dimension or perhaps transition from possible other but indefinable dimensions do what they do in maintaining the cohesiveness of atomic structures. Therefore, fundamental interactions are no less than well labeled, no matter how hard we try to define them other than by what they do.

***** Fundamental interactions had their beginnings during the time of the big bang. Concentrated fundamental interactions are in play wherever there are atomic structures. Simply put, without these crucial interactions we would not have microstructures, at least as we know them. Is it then possible that so-called dark energy and dark matter were and are interconnected to form an essential conduit for the propagation of these fundamental interactions?

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