Information and Reality

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Abstract for Part 1 Schrodinger Fundamentals

Practitioners of quantum mechanics (QM) have known for some time that observations are probability based and that consciousness is involved [18][3]. Our mind is very good at creating an internal model of the information it receives from reality. Schrodinger's equation helps understand the relationship between reality, our internal model, energy and time. I believe in physical reality but also believe that consciousness is a fundamental characteristic of nature. Evidence will be presented that consciousness created physical nature and provides structure that allows consciousness to re-emerge.

Over centuries physical nature has been well characterized in terms of particles, fields, etc. It is not difficult to characterize these with information models. We will show energy components for neutrons, protons and electrons and their associated probabilities. Nature is based on quantum circles but they can be real or information based. The difference is important and leads to clues regarding nature's enduring questions.

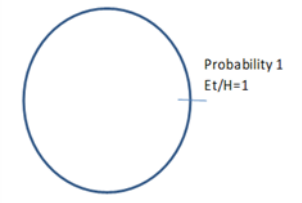
Part 2 of this document presents details that support the part 1 concepts.

Probabilities in physics

Schrodinger's equation [3] associates exponents containing time (t) and energy (E) with a probability (P). Complex number exponents give P= psi*psic= exp(iEt/H)*exp(-iEt/H)= 1 where i= the imaginary number, H is Heisenberg's constant and exp stands for the natural number e to the power of (iEt/H). We will associate consciousness with collapse of the wave function psi*psic at probability= 1. Probability represents reality and it can contain a great deal of information. We will look deep inside probability= 1 and find the energy and time values that define fundamental components of nature like quarks. Quarks can also be defined by probabilities instead of energy and time. Consciousness is adept at accessing and using this information.

Since energy is in the exponents of the equation above, we take the natural log of the equation to deal directly with energy. The energy values of interest are ratios that equal 1 and the natural log of 1 is zero. Ratios are equivalent to adding and subtracting logarithms. For example E1/E1*E2/E2= 1 but the natural log is (E1-E1)+(E2-E2)= 0. The author uses an equation E=e0*exp(N) (derived below) to evaluate energy E.

Derivations



Restriction 1: We will deal with probabilities represented by complex conjugate multiples that give probability 1, specifically, P=exp(-i Et/H)*exp(i Et/H)=1 where Et/H=1.

Restriction 2: We will only deal with quantum circles. The time t to circle a field at radius R is t=2 pi R/V. The energy in the field is E and E*t/H=1 where H is Heisenberg's constant (4.13e-21 MeV-sec). Information based quantum circles are based on probabilities but the exponent is simply the value (1i)/(1i)=1.

We will take the natural logarithm (ln) of both sides of an equation. Recall that adding logarithms of values is equivalent to multiplying the values and ln(value)-ln(value) is equivalent to dividing values. Also recall that an exponent changes its sign when it moved from the top of an equation to the bottom of an equation. The anti-logarithm is used to recover the original values. For example:

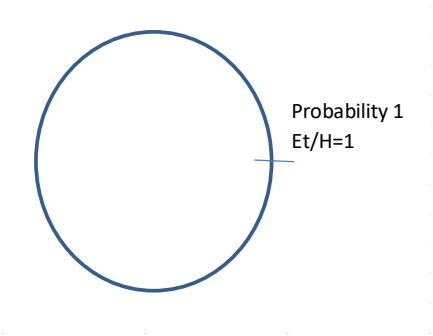
P	p1*p2=exp(-i Et/H)*exp(i Et/H)	
	with Et/H=1	
multiply by adding the logarithms		
ln P	ln(p1*p2)=-i+i=0	
P	exp(0)=1	

Example of exponent sign change:

7.39=exp(2)	7.38906
7.39=1/exp(-2)	7.38906

Components of P=1 and quantum circles with Et/H=1

Looking ahead, it takes four probabilities p1/p2*p3/p4=1 to describe one of the quark quantum circles inside neutrons and protons. We will look for probabilities that obey further restrictions that I call constructs.



The probability= 1 construct

Probability 1=p1*p2/(p3*p4).

We will divide two complex probability pairs that equal 1, specifically:

P=1=(p1*p2)/(p3*p4)= (1/exp(13i)*1/exp(12i)/(1/exp(15i)*1/exp(10i)).

The exponent changes it sign from positive to negative when it is moved from the bottom to the top of the relationship. This expression will be evaluated below using natural logarithms of exp(-Ni).

exp(-13i)	exp(-15i)	
exp(-12i)	exp(-10i)	
exp(-13i)*exp(-12i)/(exp(15i)*exp(13i)=1		
exp(-13i)*exp(-12i)*(exp(15i)*exp(10i)=1		
multiply the above by adding logs		
0=-13i-12i+15i+10i		
0=-25i+25i		
take the anti logarithm		
P=exp(0)=1		

The energy= 0 construct

Next, we will evaluate quantum circle components that have overall zero energy. This is possible because mass plus kinetic energy is positive and the equal and opposite field energy is negative. The example above will be used to extend the probability 1 construct to create the energy zero construct. Positive and negative terms eliminate the imaginary numbers. Ratios with imaginary terms are equal to ratios without imaginary terms.

1= exp(-13i)*exp(13i)=exp(-13)*exp(13).

Energy zero construct

N1=13i N3=15i
N2=12i N4=10i

p1=exp(-13i) p3=exp(-15i)
p2=exp(-12i) p4=exp(-10i)

1=p1*p2/(p3*p4)

exp(-13i)*exp(-12i)/(exp(15i)*exp(13i)=1
exp(-13i)*exp(-12i)*(exp(15i)*exp(10i)=1
add balancing terms to the above multiplication
exp(-13i)*exp(13i)*exp(-12i)*exp(12i)*exp(-15i)*exp(15i)*exp(-10i)*exp(10i)=1
multiply the complex conjugates
1*1*1*1=1

This is equal to:
exp(-13)*exp(13)*exp(-12)*exp(12)*exp(-15)*exp(15)*exp(-10)*exp(10)=1
And equal to the following because exp(-N)*exp(N)=e0/e0*exp(N)/exp(N)=1
e0*exp(-13)*e0*exp(13)*e0*exp(-12)*e0*exp(12)*e0*exp(-15)*e0*exp(15)*e0*exp(-10)*e0*exp(10)=1

Taking the natural log converts the expression to addition and subtraction that totals zero (ln 1=0)
the terms remain matched equal and opposite pairs.
0=e0*exp(13)-eo*exp(13)+e0*exp(12)-e0*exp(12)+e0*exp(15)-e0*exp(15)+e0*exp(12)-e0*exp(12)
With e0 defined as energy, this converts the probability 1 equation to an energy zero equation.
The energies are exponents of the equation psi=exp(iet/h). The matched pairs represent psi*psic=1.
The restrictions above apply:
They satisfy the Schrodinger equation if the numbers are imaginary, i.e 13 is really 13i.
They satisfy the Schrodinger equation if t equals H/E.

With the derivations above, P= 1= (1/exp(N1)*1/exp(N2))/(1/exp(N3)*1/exp(N4)). The numbers are complex but the imaginary numbers are eliminated by multiplication and division. The four numbers (N1, N2)/(N3, N4) will be called a quad used to mathematically describes a quantum circle. The energy zero construct derives the equation E=e0*exp(N1) and allows us to evaluate the mass, kinetic energy and fields of quark quantum circles. E1=e0*exp(N1) is associated with mass, E2=e0*exp(N2) is kinetic energy, E3=e0*exp(N3) is field1 and E4=exp(N4) is field2. I haven't forgotten that the exponents are (iEt/H). There are four E's but we can always find a time t that gives iEt/H=1 for each E. They are in pairs that eliminate the imaginary number.

But P in the paragraph above is just a probability. When we took the natural log we were dealing with the four exponents each with Et/H=1 but they don't have to be ratios of energy and time; they can simply be 1's. The quantum circle can either be probabilities or real time and energy.

Application of Fundamentals to the Neutron and Proton

N values for neutron mass and kinetic components

What follows uses the restrictions discussed above and constructs, probability= 1 and energy= 0. It uses the equation E=e0*exp(N) with N values carefully selected to eliminate imaginary values by multiplication and division.

Looking ahead the column on the right hand side of the diagram below creates a fine mathematical model of the proton. The left column contains N values for mass and kinetic energy components and the right column contains N for fields. Using the discussion above, the first quad (mass, kinetic energy)/(field1, field2) is (15.43, 12.43)/(17.43, 10.43). These values describe a quantum circle for one of the quarks.

Mass Field1

Kinetic energy Field 2

	Neutron particle and kinetic energy N			Neutron field energy N
Quad 1	15.43	quark 1	17.43	strong field 1
	12.43	kinetic energy	10.43	gravitational field component
Quad 2	13.43	quark 2	15.43	strong field 2
	12.43	kinetic energy	10.43	gravitational field component
Quad 3	13.43	quark 3	15.43	strong field 3
	12.43	kinetic energy	10.43	gravitational field component
Quad 4	10.41		-10.33	
	-10.33		10.41	gravitational field component
Quad 4'	10.33	pre-electron	10.33	
	0.00		0.00	
	90.00	Total	90.00	Total
	Table 1		Table 2	

There is a specific position for mass, kinetic energy, the strong field and the gravitational field component. We can view the values on the right as separations from values on the left. For example 15.432+2= 17.432 and 12.432-2= 10.432 is a separation involving N=2. Quantum circles for the three neutron quarks are represented by the first three quads. N=12.432 is the log of a specific kinetic energy. Going back to the probability 1 construct, we will use the following quad for the first circle.

15.43 17.43

12.43 10.43

The probability 1 construct is: p=1/exp(15.43)*1/(12.43)*exp(17.43)*exp(10.43)=1

Quad 1 key	N1	E1 mass	N3	E3 field1	
	N2	E2 ke	N4	E4 field2	
		MeV=2.02e-5*exp(N)		MeV	
Quad 1	15.432	101.947	17.432	753.291	
	12.432	5.076	10.432	0.687	
	27.864		27.864		
		N is conserved			
		N1+N2=N3+N4			
	N=ln p	(p=1/exp(N))			
p1	15.432	1.986E-07	17.432	2.688E-08	P3
p2	12.432	3.989E-06	10.432	2.948E-05	P4
	Probabilities are conserved				
	p1*p2	7.923E-13	p3*p4	7.923E-13	

The quad conserves N= 27.864 and probability P1*P2=P3*P4= 7.9e-13.

The energy= 0 construct follows using N values for the neutron and energy E=2.02e-5*exp(N). The values are arranged differently in the table below. Energies E3 and E4 on the right hand side of the table represent field energy. Mass plus kinetic energy is exactly balanced by negative field energy. The quad describes a quantum circle. The mass with kinetic energy circles in a field and is attracted to a second field (nested quantum circles). Kinetic energy has two components E2 and (E3+E4-E1-E2). There are

positive and negative balancing pairs of N because E1+(E3+E4-E1-E2)+E2 -E3-E4=0=(E1-E1)+(E2-E2)+(E3-E3)+(E4-E4). I haven't forgotten that the exponents are (iEt/H), but we can always find a time t that gives iEt/H=1. They are in pairs that eliminate the imaginary number.

	ke (difference ke)			E3 field1	
E1 mass	E3+E4-E1-E2	E2 ke			E4 field2
mev	mev	mev		mev	mev
101.947	646.955	5.076		-753.291	
					-0.687
E1+difference ke		753.978		E3+E4	-753.978

The above relationships are repeated below for the other two quarks in the neutron.

quad 2&3	13.432	15.432	101.947
	12.432	10.432	0.687
	25.864	25.864	

13.797	88.837			-101.947	
					-0.687
E1+difference ke		102.634		E3+E4	-102.634

The neutron mass model

Information (N) values from the neutron component table were used to a model the neutron's known mass, 939.56 MeV shown below.

	Unified.xls cell cq5 sheet 2										
	Calculation of Neutron Mass				Mass and Kinetic Energy					Field Energy	
	mass	Energy	S field	Energy	Mass	Difference	strong residual	Neutrino	Expansion	Strong fiel	Gravitatior
	ke	MeV	G field	MeV	MeV	MeV	MeV	MeV	KE or PE	MeV	Energy Me
Quad 1	15.432	101.95	17.432	753.29	4.357	651.344				-753.29	
	12.432	5.08	10.432	0.69		97.590					-0.69
Quad 2	13.432	13.80	15.432	101.95	2.490	88.150	10.15		10.15	-101.95	
	12.432	5.08	10.432	0.69		**11.307**					-0.69
Quad 3	13.432	13.80	15.432	101.95	2.490	88.150			10.15	-101.95	
	12.432	5.08	10.432	0.69		**11.307**					-0.69
						-30.45					
						2.06					
Quad 4	-10.333	0	-10.333	0	0			0.67	t neut ke	0	-0.67
	10.408	0.67	10.408	0.67				0	neut m		
Quad 5	10.333	0.622	10.333	0.622	0	0.62				-0.62	
			0.000	0.000							0.00
	90.000	sum	90.000	sum	9.3361	920.0780	**939.5654133**	0.67	20.30	-957.807	-2.73
							NEUTRON MASS		Total m+k	Total fields	
									Total posit	Total negative	
									960.539	-960.539	0

Three quads are associated with three quarks and the fourth and fifth quads transition to the electron as the neutron model transitions to the proton model. The values toward the left side of the box, labeled mass and kinetic energy are balanced by fields on the right hand side of the box. The quad N values are the source of the energies (E=e0*exp(N)). Each quark has a kinetic energy operator N=12.431 that gives

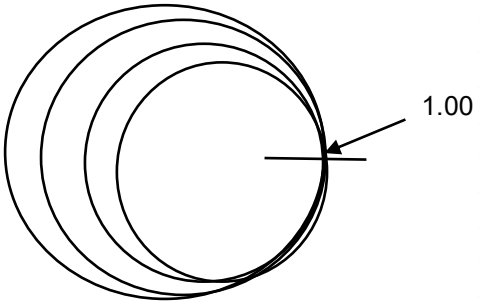
mass kinetic energy. It's associated energy=2.025e-5*exp(12.431)=5.07 MeV. E2+E2= 10.15 MeV is used in fusion calculations and cosmology. This creates quark quantum circles with kinetic energy bound by associated field energies.

The kinetic energy column has several components. Kinetic energy for each quad =E3+E4-E1-E2-E2. The E2's are added back to form the columns labelled weak kinetic energy (10.15 MeV) and gravitational expansion energy (20.3 MeV).

After studying mesons and baryons [17] it was determined that mass plus kinetic energy within each quad is conserved, but mass for the three quarks= 9.34 MeV with corresponding higher kinetic energy. The neutron model is shown in that configuration above. Besides the obvious quantum circles for the three quarks, there are several other quantum circles of interest. For example the values highlighted are involved in atomic fusion (Topic 2). Another set of important quantum circles are based on 939.56 MeV orbiting with 10.15 MeV orbiting in the gravitational field 2.73 MeV (Topic 3).

Review

P=exp(i Et/H)*exp(-i Et/H)=1 represents wave function collapse we associate with consciousness. But we now know the probability components of 1 and their relationship to quantum circles. The circles can be different sizes with probability components p1*p2/(p3*p4)= 1= 1/exp(13.43)*1/exp(12.43)/(1/exp(15.43)*1/exp(10.43)). I call the values (13.43, 12.43)/(15.43, 10.43) a quad. They define a quantum circle that is either real or information based. When it is real it contains mass E=e0*exp(13.43) with kinetic energy component E=e0*exp(12.43) orbiting a field E=eo*exp(15.43). When it is information, it is simply P=1 at the collapse point 1.



Origin of physical nature

It is not unreasonable to believe that the "big bang" involved the Schrodinger relationship. Consciousness existed and apparently contained information that described quantum circles for the neutron components. Quads for the quarks (13.43, 12.43)/(15.43, 10.43) are based on the logarithm 90 (Topic 1 entitled "Correlation…."). The overall probability that they represent one neutron with mass, kinetic energy and fields was 1/exp(90)*1/exp(90). Probability was maintained at 1 by duplicating the neutron exp(180) times. The neutron quantum circles based on these N values are the main components of nature. The Schrodinger relationship supporting consciousness is the same whether the circles are real or not. Consciousness apparently allowed the quantum circles to transition from information based circles to real ones. The result appears spectacular because the neutron was duplicated many, many times. It started with simple information but we observe stars orbiting in galaxies that are very real.

It is reasonable to believe that we are late comers able to interact with nature that pre-dates us. Consciousness activated the information that became our reality. Most of us agree that we should not confuse mathematical models with reality but consciousness contains the potential for both. Sir James Jeans said, that "the universe begins to look more like a great thought than a great machine". He was on the right track but didn't have the tools to understand its structure. The structure is probability based and inclusive.

Emergence of new consciousness

Life as we know it did not exist for billions of years after the big bang. The sequence below progresses upward as consciousness emerges. Quantum circles represent memory "aligned" at the point Et/H=1 by the constructs probability= 1 and energy= 0. The quads that define proton and neutron quark quantum circles are the bottom layer of a "memory structure" available to consciousness. Probability 1^4 emphasizes that each quantum circle is represented by quad probabilities.

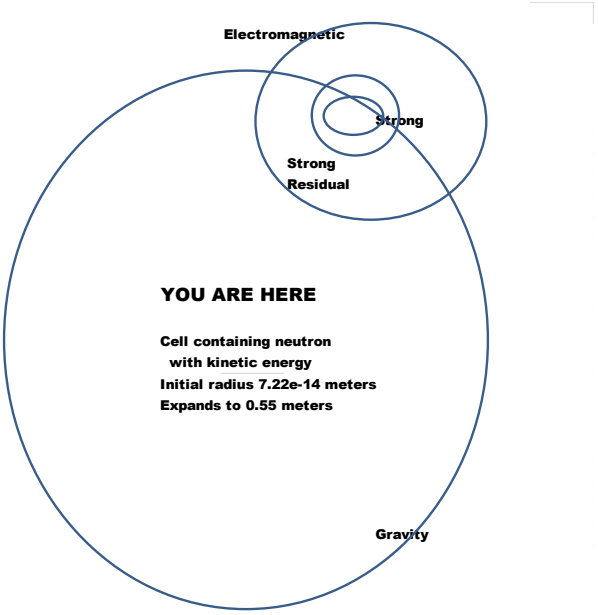
Probability 1 structure=consciousness	
1^4*many	Consciousness united
1^4*many	our body/mind evolve based on complex internal reality models
1^4*many	electrons within chemicals form complex networks
1^4*many	protons and neutrons form atoms with electronic structures
1^4*many	protons on expanding graviational quantum circles
exp(180)	duplication
1^4	proton/neutron quark quantum circles

Distance

Like the time/energy quantum circles above, distance is a quantum circle collapse point.

R=HC/E=EtC/E=tC	
Distance is time but perceived differently	
time passes	
distance is tC	
we perceive distance because light	
comes to us from exp(180) cells	
Et/H=1=E/c*tC/H=mC^2/c*tC/H=1=mc*x/H=1	
	distance is associated with various type of energy
	but energy is a logarithm
	therefore distance is also 1.

After duplication (Topic 3 entitled "number of …") neutrons and protons lie outside one another. Geometry the author calls cellular cosmology determines the next step. Cellular cosmology is based on the equivalent area of a large spherical surface and exp(180) small surfaces that fill the large sphere. Each small sphere is called a cell and contains a surface proton. Part 3 Topic entitled "Space" explains this geometry and calculates the gravitational constant G from fundamentals.



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exp(180)	duplication
1^4	proton/neutron quark quantum circles

Expanding gravitational circles can even be quads (Topic 3, "Expansion P=1…").

Electrons

The traditional explanation for electronic orbits is shown below. They contain the quantum jumps that explain light but confused scientists of the early 1900's. The electron transitions according to quantum numbers. Light emission/absorption is a change in the electromagnetic field. Kinetic energy 1.36e-5 MeV is constant for the quantum circles below since they all have the same velocity/C= 0.0073. The quantum reduced field energy 3.4e-6 MeV multiplied by time around the circle (2.12e-10 seconds) only equals H/2. But E is only half the energy, the other half is magnetic energy. This allows light to radiate through space as a wave alternating between an electric field and a magnetic field.

Electromagnetic					
	4.13567E-21				1.890E-06
			1	4	9
			MeV		
Field Energy E (MeV)			**2.722E-05**	**3.402E-06**	**1.512E-06**
Particle Mass (mev)			**0.511**	**0.511**	**0.511**
Mass M (kg)			**9.11E-31**	**9.11E-31**	**9.11E-31**
Kinetic Energy (mev)			**1.361E-05**	**1.361E-05**	**1.361E-05**
			1.361E-05		
Gamma (g)=m/(m+ke)			**0.99997**	**0.99997**	**0.99997**
Velocity Ratio		**v/C=(1-(g)^2**	**7.298E-03**	**7.298E-03**	**7.298E-03**
R (meters) =((HC/(2pi)/(E*M/g)^0.5)			**5.291260E-11**	**1.496554E-10**	**2.244831E-10**
			5.291E-11	**2.117E-10**	**4.762E-10**
Force	**Newtons**	**F=E/R*1.60**	**8.241E-08**	**3.642E-09**	**1.079E-09**
				4.000E+00	**9.000E+00**
Inertial F Nt		**F=M/g*V^2/**	**8.241E-08**	**2.914E-08**	**1.942E-08**
			y	y	y
time=2pi R/C (sec)			**1.52E-16**	**6.08E-16**	**1.37E-15**
e*t (mev-sec)			**4.136E-21**	**2.068E-21**	**2.068E-21**
e*t/h			1.000E+00	5.000E-01	5.000E-01

Electron quantum circle P=0, E=0 constructs

Probability 1 structure=consciousness					
1^4*many	Consciousness united				
1^4*many	our body/mind evolve based on complex internal reality models				
1^4*many	electrons within chemicals form complex networks				
1^4*many	protons and neutrons form atoms with electronic structures				
1^4*many	protons on expanding graviational quantum circles				
exp(180)	duplication				
1^4	proton/neutron quark quantum circles				

Electron quantum circles are shared in a very specific way that allows them to combine into chemicals with complex electronic structures. This unique feature allows networks to form. Some molecules form networks like our nerve cells with DNA inside. We are describing the structure that supports consciousness. The analysis below starts with the electron quad of the proton model. The value 1.89e-6 MeV at the top of the table is the energy absorbed when the electron shifts between quantum number 3 to quantum number 2. Probability 1, energy 0 for the quantum 2 energy levels is shown below.

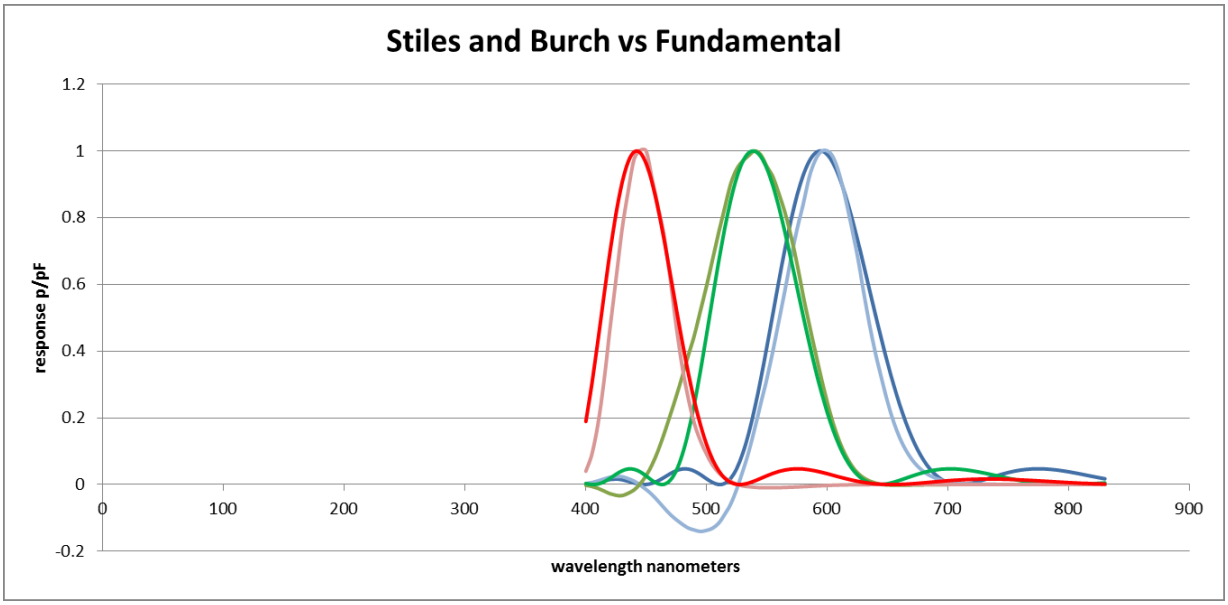
	Probability 1	1/exp(10.13)*1/exp(-0.4)/(1/exp(11.52)*1/exp(-1.78))			
	Energy zero	E1+	(E3+E4-E1-E2)+	E2	-E3-E4=0
	Energy zero	0.511	1.53	1.36085E-05	-2.04
				sum	0
	1	3			
	2	4			
			2^2		
Electron Quad from Proton Model			4	0.511	2.04
in yellow			2.08	1.361E-05	3.402E-06
	10.136	10.333	1	10.136108	11.52242769
	0.197	0.000	0.69	-0.397322603	-1.783641542

The electron orbits shown above are a convenient model but above, we have found the quads that produce an equivalent quantum circle. P=1, where Et/H=1 and the quad is (10.13, -.04)/(11.52, -1.78). Our probability based consciousness uses these quantum circles as memory, networks and senses that connect and model reality. N=3*0.0986 is exactly N for the electromagnetic field. (E=2.02e-5MeV*exp(3*0.0986)). N=0.0986=ln (3/e) where e is the natural number 2.71. The value 0.0986 is one unit of information and 1/3 charge (quarks charges are often 1/3). The electromagnetic field is our primary outside interface. Light is processed into observations by our probability 1 based consciousness creating an internal model of reality. This could be the basis for a unique network that underlies color vision in humans. This series is created by adding multiples of 0.0986 to each of the 3^2 to 2^2 quantum transitions.

Series N	Energy MeV	P=e0/E e0=2.02e-5	Meanin	Color (nm)
0.000	2.02472E-05	1	→	652.05
0.099	2.23456E-05	0.906094	→	590.82
0.197	2.46614E-05	0.821006	→	535.34
0.296	2.72173E-05	0.743909	→	485.07
0.394	3.0038E-05	0.674051	→	439.52

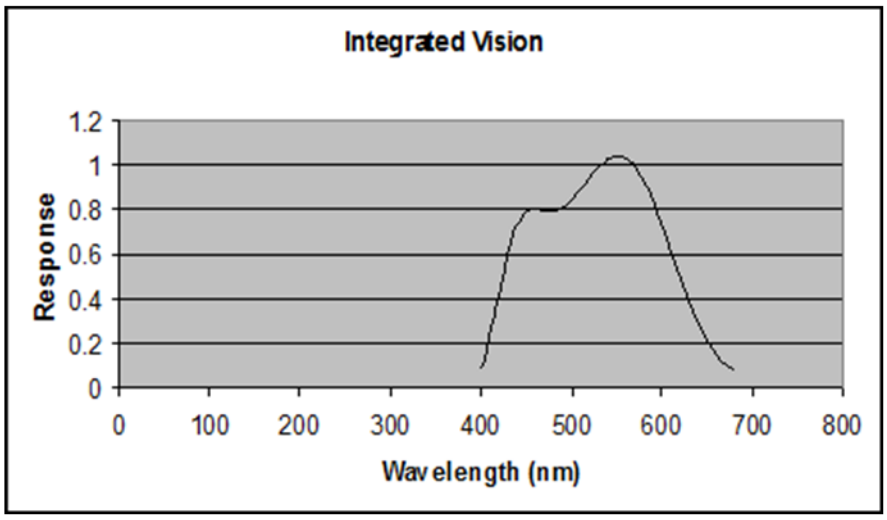
Our electromagnetic based interface provides information for our consciousness. All it takes is four networked protons with their associated electrons to give us color vision. Using the quantum mechanical Feynman equation [3][Part 2 Topic 4] for absorption of light, our mind sees in color although the information entering our eyes are simply N values related to the frequencies associated with red, green, scotopic and blue light. The processing in our brain is probabilistic (fuzzy logic) in nature and neurons sometimes carry logarithmic information [8][2].

Stiles and Burch (UCSB)[7] measured the response of the eye to colored light. The measured response compares favorably with the Feynman equation for absorption of light using the N series 0.0986. The graph below plots the Feynman equation pf/pF for the three color peaks 594, 538 and 442 nanometers. The associated width series was 61, 55 and 41 respectively for red, green and blue responses based on differences between the primary frequencies.



The calculations are the lighter colors and the dark colors are Stiles and Burch.

The explanation for color vision being sensitivities to different wavelengths based on N=0.0986 is surprising and new. Rather than four full distinct pf/pF responses, we see white light and this indicates that our human color vision system is a network that integrates responses.

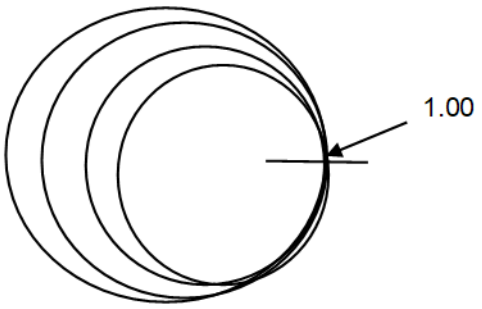


The other hues are comprised of combinations of these colors without full spectrums and it clear that the brain is adept at creating meanings from these curves. Other senses have different multi-wavelength responses (the ear for example).

Consciousness

The upper levels of the diagram below are called color vision and body/mind evolution. Their probabilities are easily associated with consciousness.

Probability 1 structure=consciousness					
1^4*many	Consciousness united				
1^4*many	our body/mind evolve based on complex internal reality models				
1^4*many	electrons within chemicals form complex networks				
1^4*many	protons and neutrons form atoms with electronic structures				
1^4*many	protons on expanding graviational quantum circles				
exp(180)	duplication				
1^4	proton/neutron quark quantum circles				



Think of linked quantum circles like a huge memory bank built to be readily accessed. The proton has quantum circles but when atoms form their potential meaning increases. This progression goes upward through chemicals that have networks. At a higher level we can consider the memory bank DNA which contains thousands of information segments. Consciousness selects quad information (psi and psic) from the structure to multiply to P=1.

Aside: There is a very important characteristic of DNA that most don't realize. DNA is in each cell of our body but DNA acts as **one** to coordinate construction of a very complicated machine.

Consciousness's memory bank is in the chemicals of your body but they act as one like DNA. Some chemicals (rhodopsin for example) aid sense networks based on the electromagnetic field. Our senses evolve with our body and improve the input our brain receives. Quantum circles are slightly changed by light absorption and "vibrate" back and forth to create the Pf/Pfo function (Topic 4). The quantum mechanical equation is known and we can mathematically simulate color vision with our computer. Information is produced by adding the pf/pF responses and consciousness creates an image based on position, color, etc.

Consciousness can select out of memory the information that it wants to bring into its model of reality. Time advances and consciousness is challenged to improve its model of reality. Like any language it is based on symbols that it forms into concepts and eventually complex meanings. Consciousness understands complex quantum circle symbols and we automatically believe that the image we are viewing is reality outside of us. There is a relationship but the image we are viewing is internal information. Structured probabilities (1^4*many) have many components some of which can operate like neural networks. It is known that neural networks [8] have feedback loops that adjust probabilities based on expectations (similar to fuzzy logic). Integration of memory senses and expectations create our reality. There is information gain associated with the path the action potential takes. If the path taken is improbable, the information gain can be quite large. Many possible pathways are stored and improved but their function is to provide temporary information in our consciousness. Much of the information

entering the visual cortex is from the cerebral cortex. Above we used a DNA analogy to describe the probability 1 structure. The structure supports consciousness but its memory bank contains DNA that builds an electrochemical network to support its senses. As the brain evolves, freedom for each individual to be different emerges because the information is not "hardwired". An organism with an image about the things around it can exploit its environment. It can recognize patterns and survive threats. It evolves if it can replicate itself. DNA is stored evolutionary information that codes for the body, brain and sense components of the nervous system. As the body, brain and its senses evolve there is a vast array of potential thoughts available.

What comes next?

Nature is real. Considering that your body is progressing toward the end of its existence, are you sure you want be real? The consciousness that existed in the beginning contained information that became real. Quantum circles can be energy with kinetic energy in a field or they can be mathematical entities based on information. Reality emerged and we became part of reality. Our consciousness emerged and now we recognize that we are part of something larger. Our consciousness came later but apparently operates on the same principals. We could be part of a consciousness that has the option of being information based. This is a fantastic thought. I don't have a problem being consciousness based on probability because it says I am made of fundamental stuff. Some scientists may resist this because it is "outside of physics" but it relates to many of our enduring questions.

Part 1 Summary

Consciousness predated and created what we eventually perceive as physical reality. It is based on selecting quantum circle information and Schrodinger wave function collapse. Quarks, protons, atoms and chemicals with electrons represent memory and networks in a structure available to the consciousness that controls it. Consciousness re-emerges within individuals and we are progressing toward an end point. But the quantum circle language can be either real energy and time or mathematical symbols. We are betrayed by the real alternative and reach an end point. We can also believe that consciousness is inclusive. Many have reached similar conclusions including religious people, eastern philosophies and some philosophers.

Part 2 Information and Energy

Topic 1 Correlation of Fundamental Energy with N

The best data for fundamental particles is in column 3 below labelled Particle Data Group [4] but column 5 contains data from other reputable sources. The value N listed in column 2 shows a natural logarithmic correlation with the data. The quarks form a series with N=4 separating members of a family, i.e. Up, Strange, Bottom and Down, Charmed, Top. The bosons are variations of N=22.5. The electron allows us to find e0 and E=e0*exp(N) values in column 4 can be compared to the data.

unifying concepts.xls cell aw48			Proposed	IS Hughes
		Particle Data	Energy	Bergstrom
		Group energy	E=eo*exp(I	Randall
Identifier	N	(Mev)	(Mev)	energy
			e0=2.02e-5	(Mev)
0.0986	0.0986			
e neutrino	0.197	2.00E-06	2.47E-05	3.00E-06
E/M Field	0.296	0.0000272	2.72E-05	
	(3*.0986=.296)			
ELECTRON	10.136	0.51099891	0.511	
mu neutrin	10.408	0.19	0.671	less than 0.25
Graviton*		1.75E-26	2.732	
Up Quark	11.432	1.5 to 3	1.867	1.5 to 4.5
E Op	12.432		5.076	
Down Qua	13.432	3 to 7	13.797	5 to 8.5
Strange qu	15.432	95+/-25	101.947	80 to 155
Charmed	17.432	1200+/-90	753.29	1000 to1400
Bottom Qu	19.432	4200+/-70	5566.11	4220
Top Quark	21.432		41128.30	40000
W+,w- bos	22.106	80399	80668.71	81000
Z	22.228	91188	91154.0	91182
HIGGS	22.575	125300	128992.0	105000

A logarithmic information code was developed from the above data and a subsequent model of the neutron, proton and electron. I speculate that it involves four arithmetic operations, the first of which is simply, divide the N= 90 by 4 to give four values of 22.5 each. Arrows mean a separation has occurred. The "fundamental N" values on the right side of the table are additions across each line in the table.

						Fundamental	
		Operation 1				N values	
			Operations 2----------->4				
Bosons		22.5	10.167	5.167	0.099	15.432	set1
			12.333		0.099	12.432	
Bosons		22.5	10.167	3.167	0.099	13.432	set2
			12.333		0.099	12.432	
Bosons		22.5	10.167	3.167	0.099	13.432	set3
			12.333		0.099	12.432	
			0.667		0.075	0.075	set4
Bosons		22.5	11.500				
			10.333			10.333	
Total		90	90			90	

Information Code

Topic 2 Binding Energy Fundamentals

Binding energy appears to be based on probabilities. For example, the probability of a neutron in lithium 3 is given by P=1/exp(2/3). The 2 means there are two types of particles (protons and neutrons) and 3 is of course the number of neutrons for lithium. Energy 10.15 MeV multiplied by P is binding energy. The value 10.15 MeV is kinetic energy from the neutron quantum circle. Energy release for the neutron contribution to lithium is 10.15/exp(2/3)=5.21. In the table below the basic probabilistic approach is applied to compared to the equation E=e0*exp(N). Note that heavy atoms can have over 144 neutrons which give a potential release of 10.01 MeV of atomic binding energy, indicating that the curve is approaching "saturation" at 10.15 MeV.

Fundamentals of neutrons				e0=2.025e-5 mev	
neutrons	P =1/neutrons		N=- lnP	E=e0*exp(N)	
1.49E+78	6.71E-79		180		
	P electron				
	3.96E-05		10.136	0.511	Electron
Fundamentals of atomic binding energy				e0=10.15	
neutrons	P=1/exp(2/neutrons)		N=-ln(P)	E=e0/exp(N)	
3	0.51		0.67	5.21	Lithium
144	0.99		0.01	10.01	Plutonium

The values based on the fundamentals above (5.21 for Lithium and 10.01 for Plutonium) is the primary effect in fusion fundamentals but slight adjustments are required [19].

Consider now that neutrons are re-converted protons and both release energy as they fuse. The following calculations illustrate that the total fundamental release is the weighted contribution from the protons and neutrons. The weighted average is darkened in the table below. All energy is quoted in MeV (million electron volts).

				(p*10.15*EXP(-2/p)+(n*10.15*EXP(-2/n))/(p+n)	
protons	(10.15*EXP(-2/protons))			(weighted average)	
p		neutrons	(10.15*EXP(-2/neutrons))		
1	1.374	n		1.374	
2	3.734	2	3.734	3.734	
3	5.211	4	6.156	5.751	5.751=(3*5.211+4*6.156)/7
4	6.156	5	6.804	6.516	
5	6.804	6	7.273	7.060	
6	7.273	7	7.627	7.464	
7	7.627	8	7.905	7.775	
8	7.905	9	8.127	8.023	
9	8.127	10	8.310	8.224	
10	8.310	11	8.463	8.390	
110	9.967	272	10.076	10.044	

Lithium7 has 4 neutrons and 3 protons and the calculation above gives a total binding energy of 5.751 MeV. This is close to the NIST [8] value of 5.644 MeV but the difference is significant and there are two additions needed. The binding energy curve is based on two additional processes: retained energy and isotope number energy.

Binding Energy P=1, E=0 constructs

The possibility that a quad could describe fusion was explored.

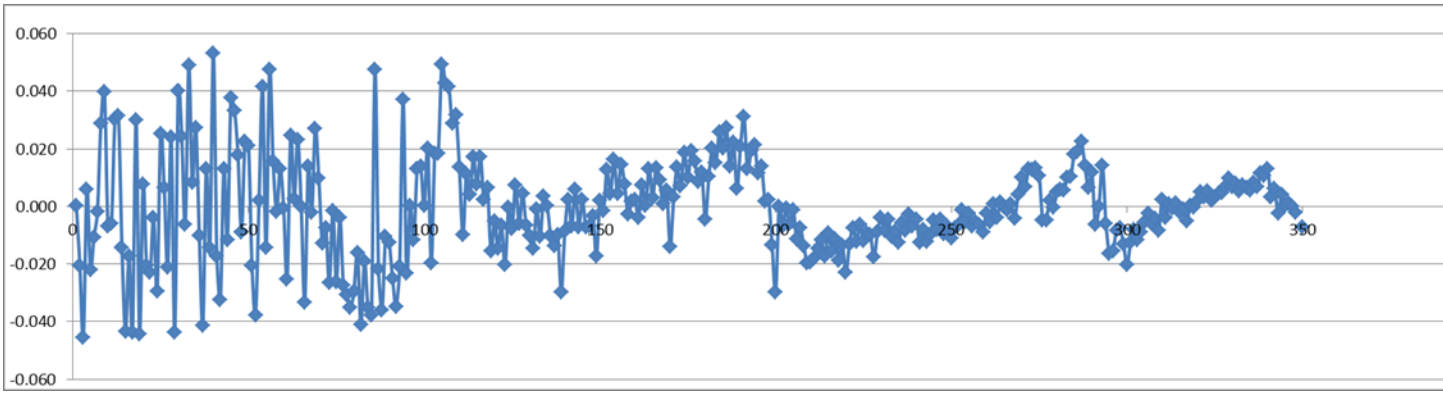
Probability 1 structure=consciousness	
1^4*many	Independent you
1^4*many	our body/mind evolve based on complex internal reality models
1^4*many	electrons within chemicals form complex networks
1^4*many	protons and neutrons form atoms with electronic structures
1^4*many	protons on expanding graviational quantum circles
exp(180)	duplication
1^4	proton/neutron quark quantum circles

An excerpt from the proton model is shown below:

	CALCULATION OF PROTON MASS				Mass and Kinetic Energy					Field Energies	
	mass	Energy	strong field	Energy	Mass	Difference	Strong residual	Neutrinos	Expansion	Strong & E	Gravitatior
	ke	MeV	grav field	MeV							
					MeV	MeV	MeV	MeV	MeV	field energ	Energy
Quad 1	15.432	101.947	17.432	753.291	4.36	651.34				-753.29	
	12.432	5.076	10.432	0.687		97.59					-0.69
Quad 2	13.432	13.797	15.432	101.947	2.49	88.15				-101.95	
	12.432	5.076	10.432	0.687		11.31					-0.69
Quad 3	13.432	13.797	15.432	101.947	2.49	88.15				-101.95	
	12.432	5.076	10.432	0.687		11.31			10.151	expansion	-0.69
						-30.45	10.15		10.151	expansion ke	
						2.06		0	v neutrino m		
Quad 4	-10.333	0	-10.333	0	0	-0.67		0.67	v neutrino	0.00E+00	
	10.408	0.67	10.408	0.67				0.67	t neutrino	-0.62	-0.67
	the electron separates here				9.34	918.78	**938.272082**	**PROTON MASS**			
Quad 5	10.136	0.511	10.333	0.622	**0.511**	0.111	0.622	Electron + ke		0.000	
	0.197	2.47E-05			**ELECTRON**			7.40E-05	e neutrino ke		
	90	sum	90	sum				1.342	20.303	-957.807	-2.732
									Total m+ke	Total fields	
									Total posit	Total negative	
									960.539	-960.539	0

			Probability 1	1/exp(13.04)*1/exp(12.46)/(1/exp(13.82)*1/exp(11.86))			
			Energy zero	E1+	(E3+E4-E1-E2)+	E2	-E3-E4=0
			Energy zero	9.335	8.152E+00	5.211352567	-22.69855978
						sum	0
Data from Proton Model				mass	Field		
in yellow				kinetic energy	E=e0*exp(N4)		
9.335	20.3	neutrons	2/neutrons	9.335	20.30		
10.15	0.815	3	→ 0.67	5.211E+00	2.401E+00		
				13.0413	13.82	energy zero	0.00
LN(10.15/2.02e-5)=13.125			13.125-.67	→ 12.46	11.68	probability 1	1.00
9.335	20.3	protons		9.335	20.30		
10.15	0.815	4	→ 0.50	6.156E+00	2.836E+00		
				13.0413	13.82	energy zero	0.00
			13.125- 0.5	→ 12.63	11.85	probability 1	1.00
			Binding Energy	5.75	(3*5.211+2*9.156)/5		

The binding energy above (5.75 MeV) is the average of the release for the neutrons and protons in lithium. By simply changing the number of neutrons and protons, the binding energy curve is produced. Since the predicted values are very close to the published binding energy, the points overlie each other and there was no need to present the predicted curve. The more meaningful graph is the following deviation for the 351 atoms including isotopes. The vertical axis is published binding energy minus predicted binding energy in MeV. See reference 19 for details.



Topic 3 Space and Time

Next we deal with what positions particles in space and allow time to elapse rather than simply repeat. This is the realm of gravitational space and cosmological time. We turn our attention to the information process that creates both. The separate/conserve processes that created quantum circles imbedded the neutron in gravitational field energy. It totals -2.73 MeV in the model below. The radius involved is space and time is around the circle's radius. The kinetic energy of value 10.15 MeV gives the neutron velocity that simulates the temperature of the big bang. A new degree of freedom now exists based on the conservation of kinetic energy (KE) and potential energy (PE). It is circled in the neutron model shown below with KE plus PE conserved at 20.3 MeV. (This total can increase if some of the strong residual kinetic energy is released by nuclear fusion but the entire model is the constant 960.54 MeV.)

Mass and Kinetic Energy						Field Energy
Mass	Difference KE	strong residual ke	Neutrino	Expansion	Strong field	Gravitational
mev	mev	mev	mev	KE or PE	energy mev	Energy mev
101.95	641.88	10.15			-753.29	
						-0.69
13.80	78.69			10.15	-101.95	
						-0.69
13.80	78.69			10.15	-101.95	
						-0.69
0.00	0.00		0.67	t neut ke	0.0E+00	-0.67
			0.0	neut m		
0.00	0.62				-0.62	
						0.00
129.5409	799.873	**939.5653446**	0.67	20.30	-957.807	-2.73
		NEUTRON MASS		Total m+ke	Total fields	
				Total positive	Total negative	
				960.539	-960.539	0.00E+00

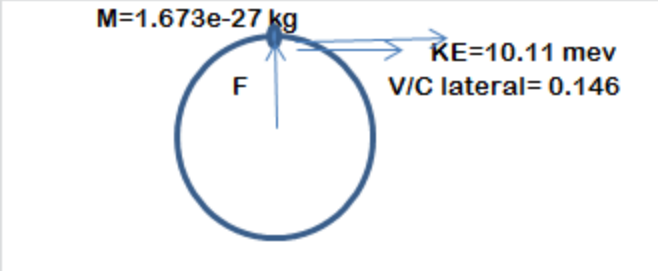
The cell radius is 7.22e-14 meters with a proton "quantum circle" with 10.11 MeV in gravitational field energy 2.73 MeV.

R (meters) =(HC/(2pi)/(E*E)^0.5	E=2.732	7.224E-14

This quantum circle is special because it defines the gravitational space and cosmological time we exist in. The time for light to travel around this cell is a unit of time that repeats and counts forward.

Gamma (g)=938.27/(938.27+10.11)=0.9897 for the proton.

V/C=(1-0.9897^2)^.0.5=0.146.



Identify the radius and time for the gravitational orbit described above				
Fundamental radius=1.93e-13/(2.732*2.732)^.5=7.224e-14 meters				
Fundamental time=7.224e-14*2*PI()/(3e8)=h/E=4.13e-21/2.732				
Fundamental time	1.514E-21	seconds		

The author believes that the cycle time 1.51e-21 seconds has repeated many times since the beginning. In other words, an unchanging quantum mechanical time unit is defined that cycles *and* moves forward (cycle time*exp(N).

Cellular Cosmology

Consider large mass M (for our purposes the mass of the universe although the term universe seems a little presumptive) broken into exp(180) small cells, each with the mass of a proton labelled lower case m below. The mass (m) of a proton is 1.67e-27 kg. Fill a large spherical volume with exp(180) small spheres we will call cells. Consider the surface area of many small cells as a model of the surface of one large sphere with the same surface area. For laws of nature to be uniform throughout the universe there can be no preferred position. A surface offers this property but the equivalent surfaces of many small spheres also offer this property as long as we do not distinguish an edge. As such a surface model equivalent to the surface of many small cells is useful if the fundamentals of each cell are known.

In general relativity [15] the metric tensor (scholarly matrix equations from general relativity) is based on (ds^2=three distances^2 and (C*time)^2). Note that ds^2 is a surface area and it is this surface that we will break into exp(180) small spheres. Let small r represent the radius of each small cell and big R represent the radius of one large sphere containing exp(180) cells with the same surface area. Position a proton like mass on the surface of each cell. The total energy will be that of one protons/cell plus a small amount of kinetic energy. We will evaluate the gravitational constant G of a large sphere and compare it with G of small cells.

Area=4*pi*R^2
Area=4*pi*r^2*exp(180)
A/A=1=R^2/(r^2*exp(180)
R^2=r^2*exp(180)
r=R/exp(90) surface area substitution
M=m*exp(180) mass substitution

For gravitation and large space, we consider velocity V, radius R and mass M as the variables (capital letters for large space) that determine the geodesic. With G constant, M=m*exp(180) and the surface area substitution R=r*exp(90), the gravitational constant would be calculated for large space and cellular space as follows (lower case r,v and m below are for cellular space):

At any time during expansion		
Large space		**Cellular Space**
		With substitutions:
		R=r*exp(90) and M=m*exp(180)
R*V^2/M=	**G=G**	**r*exp(90)*V^2/(m*exp(180))**
R*V^2/M=	**G=G**	**(r*v^2/m)/exp(90)**

The extremely small value 1/exp(90) is the coupling constant for gravity. When measurements are made at the large scale as must done to measure G, the above derivation indicates that we should multiply cell scale values (r*v^2/m) by 1/exp(90) if we expect the same G. Geometric and mass relationships give the cell "cosmological properties". I call this cellular cosmology.

It must be recognized that for equal gravitational constant the radius of curvature and mass are vastly different between the large and small scale. It was unfortunate that the great physicists of the 1900's did not have the advantage of WMAP [6] expansion model, nor did they have the advantage of knowing the approximate number of protons in the universe. Perhaps they couldn't compare cellular scale space to large space because they lacked information.

The gravitational constant is calculated below using energy values from the neutron mass model [8][13][14]. It agrees with the published constant, G=6.674e-11 newton meters^2/kg^2. The gravitational coupling constant 1/exp(90) appears in the fundamental calculation for the inertial force in a cell that has cosmological properties.

GRAVITY		
	proton	neutron
Neutron Mass (mev)	938.2720	939.565
Neutron Mass M (kg)	1.673E-27	1.675E-27
Field Energy E (mev)	2.732	2.732
Kinetic Energy ke (mev)	10.111	10.140
Gamma (g)=M/(M+ke)	0.9893	0.9893
Velocity Ratio v/C=(1-g^2)^0.5	0.1456	0.1457
R (meters) =(HC/(2pi)/(E*E)^0.5	7.224E-14	7.224E-14
Inertial Force (F)=(M/g*V^2/R)*1/EXP(90) N	3.656E-38	3.666E-38
HC/(2pi)=1.97e-13 mev-m		
Calculation of gravitational constant G		
G=F*R^2/(M/g^2)=NT m^2/kg^2	6.6739E-11	6.6743E-11
Published by Partical Data Group (PDG)	6.67E-11	6.6743E-11

The coupling constant 1/exp(90) and Heisenberg's uncertainty principle has the effect of dramatically reducing the force between protons and makes gravity very long range compared to the other forces. Defining gravity, time and distance with cellular cosmology means that nature uses the general theory of relativity at the quantum level. The constant 1/exp(90) scales the quantum level to the large scale we observe around us.

With the understanding that the large scale we observe is made of cells defined by gravity and the further understanding that fundamental time cycles, counts and moves everything forward we can simplify our understanding of nature. This cycle is established by the quantum mechanics of the gravitational field inside each proton (the proton model) and each proton is identical and none occupy a preferred position. All protons advance in elapsed time simultaneously ready for the next count (a second kind of time can be slightly longer given by the Schwarzschild equation). Elapsed time is the primary variable for the expansion equations and they determine the expanded radius.

Number of neutrons in nature

There have been several projects (COBE, WMAP [5], HSST, and PLANCK) and earlier work [15] that yield a great deal of information about the universe. Measurements and models allow astronomers, astrophysicists and cosmologists to estimate the number of neutrons in the universe. The author believes the best number is exp(180). There is a remarkable relationship between the natural logarithms 90 and the natural logarithm 180. Information (N) is a measure of how improbable an event is. It is very improbable that a single proton will form with exactly the N values listed in table 1. The probability that it will contain the particle and kinetic energy N values is: P=1/exp(N)=1/exp(90). Likewise, it is highly improbable that the proton will contain fields with the N values of table 2. Again the probability P=1/exp(90). Probabilities multiply and the probability of a neutron with these particles *and* field energies is P=1/exp(90)*1/exp(90)=1/exp(180).

But we know that neutrons exist. When we know something for certain, its probability is 1.0 [9]. An improbable event will eventually occur if you "roll the dice" many times. Nature apparently creates exp(180) neutrons to maintain probability=1 as an initial condition.

P=1=1/exp(180)*exp(180), where the probability of one neutron is very low but there are many neutrons.

The “big bang” duplicates the zero based neutron many times. Neutrons decay to protons, electrons and neutrinos in space. Yes, the dice are heavily loaded since they roll “neutron” every time (quantum weirdness).

We can calculate the number of proton like masses in the universe if we have accurate cosmology models. The critical density 9.14e-27 kg/m^3 is baryons plus dark matter. The author’s model gives a current radius R1+R3 is 4.02e25 meters and this gives volume 2.72e77 meters^3. Multiplying critical density by volume gives the number of proton like masses in the universe compared to exp(180) below. We do not know if dark matter has a proton like mass but this is an interesting number to the author because exp(180) was the starting point for the unifying theory.

rhoC	Volume	rhoC*Volume	exp(180)	rhoC*V/exp(180)
9.135E-27	2.72E+77	1.49E+78	1.49E+78	1.000

The baryon/photon ratio above separates exp(180) into baryons and dark matter. Baryons are 0.5 and dark matter is 0.5. Baryon densities is 0.5*exp(180)*1.67e-27kg/2.72e77m^3=4.57e-27 kg/m^3.

Expansion P=1, E=0 constructs

The gravitational quantum circle is the outer quantum circle defined by the neutron model. The proton is given 10.15 MeV of kinetic energy to expand the universe against an opposing gravitational field.

	Unified.xls cell cq5 sheet 2										
	Calculation of Neutron Mass				Mass and Kinetic Energy					Field Energy	
	mass	Energy	S field	Energy	Mass	Difference	strong residual	Neutrino	Expansion	Strong fiel	Gravitational
	ke	MeV	G field	MeV	MeV	MeV	MeV	MeV	KE or PE	MeV	Energy MeV
Quad 1	15.432	101.95	17.432	753.29	4.357	651.344				-753.29	
	12.432	5.08	10.432	0.69		97.590					-0.69
Quad 2	13.432	13.80	15.432	101.95	2.490	88.150	10.15		10.15	-101.95	
	12.432	5.08	10.432	0.69		**11.307**					-0.69
Quad 3	13.432	13.80	15.432	101.95	2.490	88.150			10.15	-101.95	
	12.432	5.08	10.432	0.69		**11.307**					-0.69
						-30.45					
						2.06					
Quad 4	-10.333	0	-10.333	0	0			0.67	t neut ke	0	-0.67
	10.408	0.67	10.408	0.67				0	neut m		
Quad 5	10.333	0.622	10.333	0.622	0	0.62				-0.62	
			0.000	0.000							0.00
	90.000	sum	90.000	sum	9.3361	920.0780	**939.5654133**	0.67	20.30	-957.807	-2.73
							NEUTRON MASS		Total m+k	Total fields	
									Total posit	Total negative	
									960.539	-960.539	0

I highlighted in yellow the mass, kinetic energy and field that defines the gravitational quantum circle. We will find the four number words but they obey the energy 0 and probability 1 constructs. We know in advance P=1 aligns at Et/H=1 in the probability 1 “structure”.

			Probability 1	1/exp(17.65)*1/exp(1.61)/(1/exp(13.82)*1/exp(5.45))			
			Energy zero	E1	(E3+E4-E1-E2)+	E2	-E3-E4=0
			Energy zero	939.560	-936.795	1.02E-04	-2.76493
						sum	0.00
Data from Proton Model				mass	Field	temperature=B*E2	
in yellow				kinetic energy	E=e0*exp(N4)		
939.56	2.73	neutrons		939.560	2.73		
10.15			x 10.15 →	1.015E-04	3.493E-02		
				17.65290558	11.81179551	energy zero	0.00
Original R	8.25E+12	meters		1.612042142	7.45	probability 1	1.00
Expanded R	8.25E+17	meters					
Expansion ratio=(original R/expanded R)							

As expansion occurs the original kinetic energy decreases by R/Rnow*10.15=1.e-4 MeV. The point here is that the four numbered "quad" is (17.65, 1.61)/(13.8, 5.45). The wave function collapse at Et/H=1 is assured by the fact we used the energy 0 and probability 1 constructs. If we associate probability 1 with consciousness, all it has to do is use quads to mean "protons on an expanding gravitational quantum circle". Our consciousness model associates this with distance. I believe in a 3 dimensional analog model. The points are really a universe filled with protons, etc. but the alternative is to believe they are separated by three dimensional information.

Topic 4 Equation for Capture of Light

Light is the energy absorbed/released when an electron "jumps" from a lower energy to a higher energy quantum circle. Quantum mechanics describes the allowable quantum circles [3]. Absorbed light is characterized by a discrete wavelength. We will focus on the shift in energy associated with the electron jumping from the second quantum circle to the third quantum circle (quantum number 2 to quantum number 3). This particular delta energy (1.89e-6 MEV) is special because nature uses it as the "standard" energy for perception. It is converted to a wavelength in nanometers by WL=hC/delta E*1e9=4.14e-21*3e8/1.89e-6*1e9=656 nanometers.

N	Binding Ene	Quantum no	Quantum no	Delta Energy
		2	3	
0.29583687	1.3609E-05	3.40E-06	1.5121E-06	1.8901E-06

Quantum Shifts that Produce 656 Nanometer Light

C. Shannon [30] used S= -ln P to represent information and thermodynamics incorporates similar concepts except it is the statistics of many particles. The author's N identifies particles such as an electron and components of the electric field and E= e0*exp(N). In this system, dimensionless energy ratio e0/E=P probability. Since wavelength is proportional to 1/E=1/hv (h is Heisenberg's constant and v is frequency), the probability and a dimensionless wavelength are equivalent.

P=e0/E=(h v0)/(h v)=v0/v=wl/wlo.

The equation of interest for light absorption is a wave function for a system that has an internal freedom that varies back and forth between two frequency (f) values.

Psi=mu e0/h (1-exp i (f-F) t/ (f-F))

The solution to this quantum mechanical equation is found in The Feynman Lectures on Physics, Volume III page 9-13 [3]. The basic equation for a probability pf is divided by pF to form a ratio normalized to make the peak response equal to one at the peak frequency, F. This equation will be called the absorption equation.

pf/pF=(sin((f-F)t/2))^2/((f-F)t/2))^2
Where f=frequency and t=time interval.

The absorption equation can also be written in terms of distance (D=C t), instead of time. With MC=f-F=C (1/wl-1/WL) and t/2=2D/C=1/(1/dwl-1/wl) where dwl is the width of the response curve, wl is the incoming wavelength and WL is the peak wavelength. The same equation in terms of D and M follows with (f-F) t/2= M*C/C *(2D) = 2DM. (C, the speed of light, cancels).

pf/pF= (SIN (2MD)) ^2/ ((2MD) ^2

Example calculations for red light at wavelength (wl) 400 nanometers (nanometers are meters with decimal place moved 9 places to the left):
M=1/400-1/594.3=8.17e5 meters^-1 and D= 1e-9/ (1/55.8-1/594.3)=5.73e-6 meters (573 nanometers) when the peak wavelength (WL) for red light is 594.3 nanometers and the width of the curve (dwl) is 55.81 nanometers.

Example color calculation for pf/pF				
55.81158	dwl			
594.3342	WL			
	pf/pF=(SIN(2*D*M))^2/(2D*M)^2			
	D=1e-9/(1/(WL-dwl)-1/WL)=5.73e-6			
	M=1e9*(1/wl-1/WL)			
wl	M	D	2*D*M	pf/pF
400	817444.9	5.73E-06	9.376	2.75E-05
405	786580.7	5.73E-06	9.022	1.89E-03

As wavelength increases to the peak, the quantity (1/wl-1/WL) becomes zero for an instant and probability builds to one. On both sides of WL, the absorption equation gives the response of the eye to that color. The ratio pf/pF peaks at one through the sin^2 function.

Topic 5 Properties

The properties shown below exist inside the neutron and proton [17]. Conjugation changes the proton quark (Down, Up, UP) properties into neutron quark properties. The properties below the table are the sum of the individual quark properties.

	Proton D-U-U				Neutron D-U-U (parity changes charge)			
Original parity	0.5	-0.5	-0.5		Original parity	0.5	-0.5	-0.5
Parity P	0.5	-0.5	-0.5		Parity P	0.5	-0.5	0.5
iso-spin I	0.5	-0.5	-0.5		iso-spin I	0.5	-0.5	-0.5
Charge	-0.33	0.67	0.67		Charge	-0.33	0.67	-0.33
spin (T)	0.5	0.5	0.5		spin (T)	0.5	0.5	0.5
Quark N	13.43195	11.43195	11.43195		Quark N	13.43195	11.43195	11.43195
name	DOWN	UP	UP		name	DOWN	UP	UP
Mass	4.356851	2.49	2.49		Mass	4.356851	2.49	2.49
MeV					MeV			
CPT invariance	0.67	0.67	0.67		CPT invariance	0.67	0.67	0.67
	Iso-spin		-0.5			Iso-spin		-0.5
	Proton charge		1			Neutron charge		0
	Proton parity		-0.5			Neutron parity		0.5
	Proton spin		1.5			Proton spin		1.5
	CPTI		1.5			CPTI		1.5
	Fields		-1.5			Fields		-1.5
	CPTIF		0			CPTIF		0

Fundamental particles are simple quantum circles. They have properties called spin, charge, fields and iso-spin but these are related to time. Mesons and baryons are quantum circles and their properties are simple additions of quark properties. The quarks are two sided and stacked in the proton or neutron like coins. One side of the coin displays basic properties but the reverse side is either charge conjugated or parity conjugated.

Topic 6 The neutron model "treasure box"

1) The masses of the neutron and proton with many significant digits.
2) Gravitational field energy -2.73 MeV that yields the gravitational constant G combined with the right geometry (cellular cosmology)
3) The initial expansion kinetic energy 10.15 MeV that expands cells and determines the history of our cosmos [13].
4) The value 0.111 MeV (T=1.29e9 K). When the universe decreases to this temperature neutrons readily combine with protons balancing photo-disintegration of deuterium. This is the trigger for primordial nucleosynthesis and consistent with the observation that He4 is 24% of all atoms [16].
5) The neutron contains a quantum circle with 10.15 MeV of kinetic energy. This value changes and causes the atomic binding energy curve [19] in association with 0.111 MeV that reverses neutron decay. Values from the binding energy model allow observed atomic abundances to be modelled.
6) Energy quanta found in the neutron model, properly combined, give the masses of the mesons and baryons [17].
7) Values that unify the four interactions [1]. Diagrams showing the interactions are in reference 17.
8) The possible number of neutrons in the universe (exp(180)).
9) The quantum basis of cosmological time (t=1.5e-21 sec) and space R=exp(60)*7.22e-14 meters and expanding.
10) The basis of a cosmology model that predicts that known mass plus dark matter is consistent with Hubble constant observation and CMB analysis (no missing matter). In this model, dark energy is expansion created by stars as they light up [14].
11) Values of N for masses and fields that allow the decay times of the mesons and baryons to be simulated. This includes decay time for the neutron [17].

12) The mass of the electron (m=e0*exp(10.136)=0.511 MeV.
13) The electromagnetic field of the electron (E=e0*exp(3*0.0986)=27.2e-6 MeV (N=ln(3/e)=0.0986 is derived in reference 17).
14) The kinetic energy of the three neutrinos.
15) The 0.622 MeV particle of fractional charge -0.33, multiples of which apparently form the Up and Down quarks (2.49 and 4.36 MeV).
16)

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20.

A Top-Down Approach to Fundamental Interactions [viXra:1307.0082] details a model of the proton that provides information pertinent to many aspects of nature. Starting with data from WMAP [4] that allows an estimate of the number of protons in the universe (exp(180)), where exp stands for natural number 2.712^(180) the author explored how this number is used by nature to anchor the energy of fundamental particles. This reference described models for the neutron and proton mass based on Shannon [9] type information theory. In addition, it shows that information from the model unifies the electromagnetic,

weak, strong and gravitational forces. *The Language of Nature* [viXra:1410.002829] explains the important role of probability.

On the Source of the Gravitational Constant at the Low Energy Scale [vixra:1307.0085, revised Feb 2014. Prespacetime Journal Vol. 5 No. 3 March 2014] The proton model provides the energy value of a field that allows the gravitational constant to be calculated from fundamentals. This document summarizes arguments for a low energy gravitational scale and offered an understanding of the weak and long range character of gravitation. Physics has struggled with the reconciliation of general relativity with the other fundamental interactions (strong force, weak force and electromagnetic force). The reason for the difficulty is that in general relativity gravitation is the large scale geometry of space and time and the other forces originate at a quantum level. The author offered scaling relationships called cellular cosmology that appears to resolve this conflict. With this understanding the four interactions are very similar. *Discovery of Quantum Gravity* [viXra: 1508.0128] contains details.

On Expansion Energy, Dark Energy and Missing Mass [Prespacetime Journal Vol. 5 No. 5, May 2014, viXra:1307.0089]. The proton model extends quantum gravitational theory to the field of cosmology and provides the initial expansion kinetic energy. The fundamentals of space and time are described including the relationships that accurately model expansion, temperature, gravitational history and helium abundance. Information from the proton mass model is applied to observables from the field of astronomy. Results from an expansion model are compared to values reported in WMAP analysis and CMAGIC studies. Two models of expansion are compared and a proposal regarding dark matter is discussed.

Dark Energy (viXra: 1511.0185) proposes that dark energy is the energy produced by stars. Information is presented that revises the WMAP conclusion that only 0.046 of the universe is normal protons. It now appears that the baryon (proton) fraction is 0.5 and the cold dark matter fraction is 0.5. Justification for the higher baryon fraction considers measured values of primordial deuterium.

The Effect of He4 Fusion on Primordial Deuterium [viXra:1404.0465] reviews literature regarding primordial nucleosynthesis. Measured primordial deuterium is a sensitive test that limits the baryon mass fraction. Surprisingly literature does not account for He4 fusion which releases approximately 1.6 MeV/proton. When this energy is added to temperature curves for early expansion the temperature increases and deuterium photo-disintegrates. However, as the temperature finally falls due to expansion deuterium recovers to the measured values. Calculations show that the photon/baryon number ratio does not restrict the baryon fraction from reaching 0.165.

A Simple Model of Atomic Binding Energy [viXra:1307.0102] supports the value 10.15 MeV from the proton mass model. This kinetic energy changes and causes the atomic binding energy curve. The model presented is a probabilistic model that follows the same fundamentals of reference 1.

Semi-Fundamental Abundance of the Elements [viXra:1308.0009] again supports the proton mass model and the model of atomic binding energy. It provides a probabilistic model of fusion using barrier energy from the binding energy curve model. It models the abundance of the elements produced during the life cycle of stars.

Schrodinger Fundamentals for Mesons and Baryons, October 2017 [viXra:1307.0133] extends the approach used to develop the proton mass model to data gathered for the hundreds of mesons and baryons observed at high energy labs. Although the work is somewhat tentative most of the particles have "mirror" particles that allow nature to balance properties to zero (particles with properties can be created from zero if there is a "mirror" particle).

Color vision [viXra:1311.0124v1] Since quantum mechanics it has been known that probabilities (information) are fundamental to the universe. Life is of course made out physical components but they fit together in an uncanny way. The author studied how the eye senses four light frequencies and interprets them as color vision. It is not unreasonable to think that the other senses are similar and that the brain is a great integrator and manipulator of information because it uses probabilities related to the proton model.

We define a probability component p =e0/E where e0 is a constant and has the same units as E. This means energy is increased by a low probability, i.e. E=e0/p and each E is related to time t by t=H/E.) is allowed energy values to be added and subtracted. We are simply defining the energy exponents associated with probability 1 components. But when we took the natural log we were finding the exponents. Energy is an exponent. It is also nature's main physical component. Placed in the Schrodinger equation that obeys P=1 and E=0 constructs, the quad represents a quantum circle. There is growing awareness that consciousness is a fundamental characteristic of nature.

Consciousness can access and manipulate this memory bank of information because it is defined by quads and aligned at Et/H=1 in the probability 1, energy =0 structure.