Particle-space, a unifying theory

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Abstract

If we consider particles and space together (particle-space) a simpler view of nature emerges. Perspective is recognized as a real physical effect. Nature is encoded in equal and opposite energy components of the proton. There are a huge number of duplicates that collectively represent the universe. Protons are central. Each proton defines the space and time around it and moves in that space without changing fundamental time. It is uniform throughout nature. Energy components in the proton also define Newtonian gravitational relationships. The proton contains space-time relationships that expand the universe. Because you are made of particles you adopt local particle-space as a viewing platform and your perspective becomes an information property, only sometime related to energy. Particle-space means that each particle is maintaining an exact total energy consisting of two parts, the particle itself and the space it exists in.

Background

High energy physics has presented physicists with new ideas. For example anti-protons are stable particles just like protons. They are viewed as a mirror particle, backwards in time opposite in charge and spin. Baryons and mesons are unstable particles consisting of quarks and anti-quarks. Dirac's equation predicted and experiments later showed that anti-electrons exist. These observations can be understood if perspective is a real physical property. Looking down on an x-y plane that contains a circling particle is different than looking up at the circle if charge or spin is in the positive z direction. This is the basis of the charge, spin parity triad that conjugates yet remains constant. In the particle-space model, the proton carries space information with it. The anti-proton changed its space information at the same time we changed it to an anti-particle. From its perspective, it is the same but we are now looking at it from the opposite perspective.

Developments in cosmology have also presented physicists with new ideas. The universe is expanding and space is being created by the expansion. This is given as the explanation of why expansion velocity can be greater than the speed of light and accepted by cosmologists. It is now well known that particles curve space but neither of the concepts above have not been fully integrated into physics. Large scale and small scale physics use different concepts. Particle physicists continue to view particles moving through independent space. The ideas merge in particle-space.

The author has been developing a model of proton-space for many years. It has been applied to many different physical phenomena and I continue to learn from the proton model [1][2][3][4][8][10]. Papers were written using the concept of cells containing a proton. The best paper is entitled "Zero dark matter and Zero Dark Energy" [13]. The concepts are the same but I now call it the proton-space model. I believe that viewing particles as stand-alone entities in independent space is non-physical.

Fundamental proton-space and neutron-space models

The left hand columns for each particle are mass and kinetic energy values that add to the value 938.27 MeV (939.565 MeV for the neutron). They are accurate to within 5 significant digits. The appendix contains a comparison with Particle Data Group data. Below the proton mass the model shows energy outside the proton. This part represents space. The right two columns contain field energy values. Overall the bottom (space) part of the diagram indicates that total mass and kinetic energy is equal and opposite total field energy 959.99 MeV.

Toward the center of each particle diagram values called N are listed. Energy is related to N by the equation E=2.02e-5*exp(N).

Quark mass (MeV)	Kinetic E (Mev)	N=ln(E/2.02e-5)		Field E (MeV)
101.95	646.96	15.43	17.43	753.29
	5.08	12.43	10.43	0.69
13.80	83.76	13.43	15.43	101.95
	5.08	12.43	10.43	0.69
13.80	83.76	13.43	15.43	101.95
	5.08	12.43	10.43	0.69
Weak Void	-20.30			
Weak KE	0.00			
Balance	0.00			
Neutrino ke	-0.67		10.51	0.74
ae neutrino	-2E-05			
E/M field	-2.7E-05			
938.27	MeV Proton			
	2.72E-05	0.296		
	-0.6224	-10.33		
0.5110	0.11	10.14		
electron neut	2.02E-05			
Neutrino ke	0.67	10.41		
	0.74			
expansion pe	10.15			
expansion ke	10.15			
959.99				959.99
Total N values		90.10	90.10	

Quark mas	Kinetic E	N=ln(E/2.02e-5)		Field E
(MeV)	(Mev)			(MeV)
101.95	646.96	15.43	17.43	753.29
	5.08	12.43	10.43	0.69
13.80	83.76	13.43	15.43	101.95
	5.08	12.43	10.43	0.69
13.80	83.76	13.43	15.43	101.95
	5.08	12.43	10.43	0.69
Weak Voic	-20.30			
	0.00			
	0.00			
	0.62		10.51	0.74
939.5654	MeV Neutron			
	-0.62			
	0.74	10.51		
expansion	10.15			
expansion	10.15			
959.99				959.99
Total N values		90.10	90.10	

The model as a whole represents particle-space. The entire right hand side field energy must equal the entire left hand side mass plus kinetic energy. One characteristic of the model is that balancing occurs between the two part of the model allowing it to maintain constant energy and a constant wave-function. Both sides add to 959.99 MeV. The negative (-20.3 MeV) energy above (weak void) is the weak energy field (sometime called residual strong energy in the literature). One half of this value is the kinetic energy of a quark bundle in this model. Appendix topic "Proof that kinetic energy 10.15 MeV is accurate" indicates that it is central to atomic binding energy [2] and observed abundance of the elements [4]. There is a relationship between the particle (top) part of the model and the space part (bottom). The balancing energy in the bottom (space) part is expansion plus potential energy that equals 20.3 MeV. During expansion, kinetic energy is converted to potential energy conserving 20.3.

We will examine whether the particle energies contain enough information to define, space, gravity, cosmology and high energy physics observations.

The proton-space wave function

The probability values in the proton model underlie its wave function.

For each set of values, P=1 satisfies the Schrodinger equation:

			P=1=exp(itE/H)*exp(-itE/H)				
	E					E	
	Mass plus					Strong Field Energy	
	Kinetic Energy (MeV)					Gravitational Field Energy	
	E=2.02e-5	Diff KE	N	P	N	E=2.02e-5*exp(N)	
Down Qua	**4.36**	744.55	**15.43**	**1**	17.43	**753.29**	Down Strong Field
Kinetic E		5.08	12.43		10.43	**0.687**	Grav Field component
Up Quark	**2.49**	95.07	**13.43**	**1**	15.43	**101.95**	Up Strong Field
Kinetic E		5.08	12.43		10.43	**0.69**	Grav Field component
Up Quark	**2.49**	95.07	**13.43**	**1**	15.43	**101.95**	Up Strong Field
Kinetic E		5.08	12.43		10.43	**0.69**	Grav Field component

The probabilities are p=1/exp(N), where N is N=ln(E/2.02e-5). For example;

P=1/exp(15.43)*1/exp(12.43)/(1/exp(17.43)*1/exp(10.43))=1. This means when we write:

15.43+12.43=17.43+10.43, we are specifying N values that represent P=1.

Overall the 4 sets multiply 1*1*1*1=P=1. This is the wave function for the top part of the proton model and is more fully described in Appendix 1.

The bottom part of the diagram also has a set of probabilities that represent P=1.

Weak Void	-20.30			
Weak KE	0.00			
Balance	0.00			
Neutrino ke	-0.67		10.51	0.74
ae neutrino	-2E-05			
E/M field	-2.7E-05			
938.27				
	2.72E-05	0.296		
	-0.6224	-10.33		
0.5110	0.11	10.14		
electron neu	2.02E-05			
Neutrino ke	0.67	10.41		
	0.74			
expansion pe	10.15			
expansion ke	10.15			

0.296-10.33-10.14+10.41=10.5069. Again these probabilities multiply to 1.0.

I believe the proton is stable because the five sets of probabilities=1.

Possible perspectives of velocity

Nature conserves kinetic energy, not velocity. Kinetic energy= ½ M V^2. Understanding situations that appear to add velocity require converting velocity to kinetic energy before addition. But there is another situation that causes confusion. If we don't understand velocity or recognize that it sometimes depends on perspective velocity additions can exceed the speed of light. The situation below is that each velocity arrow is a "platform" that serves as zero for the next platform (think about rockets launching rockets).

Each arrow could represent 0.9 C. If we choose to view the event from the beginning of the first arrow and think that the arrows add we calculate a velocity greater than C. Alternates are listed below:

Perspective 1: From their perspective the particles are not moving.

Perspective 2: Particles move through pre-existing independent space.

Perspective 3: Particles define space as they move. For this to be true it must contain components that define nature. This is a proton centric perspective.

High energy physics

The author is currently publishing a companion paper entitled "Baryon decay times and mass simulations". This topic summarizes the important findings. The document uses information from the Particle Data Group summarized in 2020 [16][17];

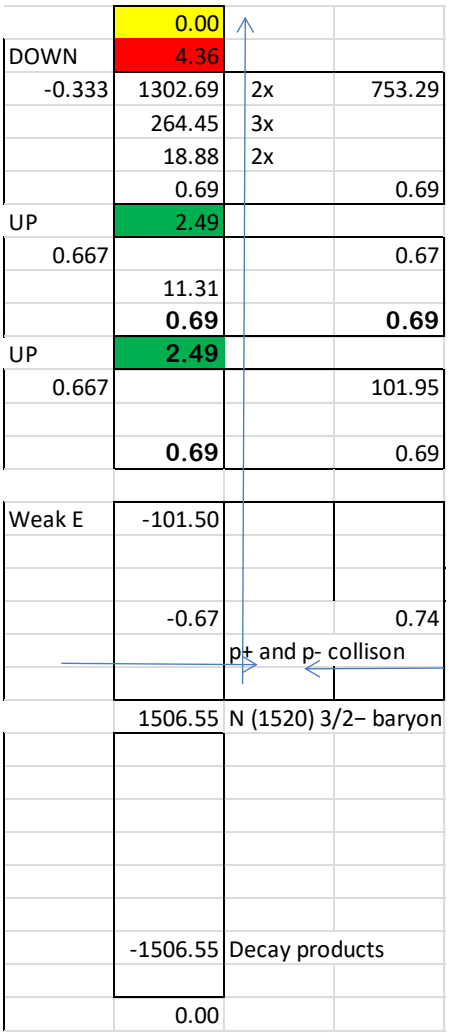
To understand whether the proton is complex enough to define nature we need more evidence about what the proton is. The following diagram is another way of showing the energy inside the proton. This model helps us understand high energy physics observations. These experiments involve creating anti-protons that collide with protons, both of which have been accelerated to high energy. Firstly consider the proton models of these two protons. These models are the same as the models above except the quarks have transitioned to lower values while conserving mass plus kinetic energy. This makes the quark mass agree with the Particle Data Group mass data.

	Quark mas	Kinetic E		Field E			Kinetic E	Quark mass	
	(MeV)	(Mev)		(MeV)			(Mev)	(MeV)	
strange	**0.00**							**0.00**	strange
DOWN	**4.36**							**4.36**	anti-down
-0.333		651.34		753.29		753.29	651.34		0.333
		88.15					88.15		
		9.44					9.44		
		0.69		0.69		0.69	0.69		
UP	**2.49**							**2.49**	anti up
0.667		88.15		101.95		101.95	88.15		-0.667
	gluon!=99.	11.31					11.31		
		0.69		**0.69**		**0.69**	**0.69**		
UP	**2.49**							**2.49**	anti up
0.667		88.15		101.95		101.95	88.15		-0.667
		11.31					11.31		
		0.69		**0.69**		0.69	0.69		
	Weak Fielc	-20.30					-20.30	Weak Field	
	Weak KE	0.00					0.00		
		0.00					0.00		
	Neutrino k	-0.67		0.74		0.74	-0.67	Neutrino ke	
	ae neutrin	-2E-05					-2E-05	ae neutrino	
	E/M field	-2.72E-05					-2.72E-05	E/M field	
charge 1	938.2721							938.2721	charge -1
electron	0.51	2.72E-05					2.72E-05	0.51	anti-electr
	electron ke	0.11					0.11	electron ke	
		-0.6224					-0.6224		
	electron n	2.02E-05					2.02E-05	electron neut	
	Neutrino k	0.67					0.67	Neutrino ke	
		0.74					0.74		
	expansion	10.15					10.15	expansion pe	
	expansion	10.15					10.15	expansion ke	
	959.99			959.99		959.99		959.99	

The anti-proton is on the right. It is a mirror image of the proton with reversed time direction. The energies in the columns are exactly opposite the proton on the left. In other words, the proton mass plus kinetic energy column (red) is equal and opposite field energy (blue). The blue field column is negative energy (time running backwards) even though we didn't put a negative sign into the values. Now consider the anti-proton, the field energy is now considered to be positive and the mass plus kinetic energy column (in blue) to be negative. The quarks have reversed to anti-quarks, reversing their charges yielding an anti-proton with negative charge.

Anti-protons are stable as long as they don't meet protons. They are kept apart before the high energy collision. When the collision occurs the anti-proton annihilates the proton and great deal of energy is available. Physicists study the baryons found in the decay products. There are 103 baryons in the 2020 PDG summary sheets. The author analyzed the baryons decay time and masses. It was found that the energies inside the proton model above can simulate all the baryons using the concept that the kinetic energies in the proton are resonances. Energy values in the Schrodinger equation exp(-iEt/H) define resonances. Energy E can be represented as a circle with a probability collapse point 1. The energy is able to surge back and forth in the circle locked in by P=1. Multiples of the base energy found in the

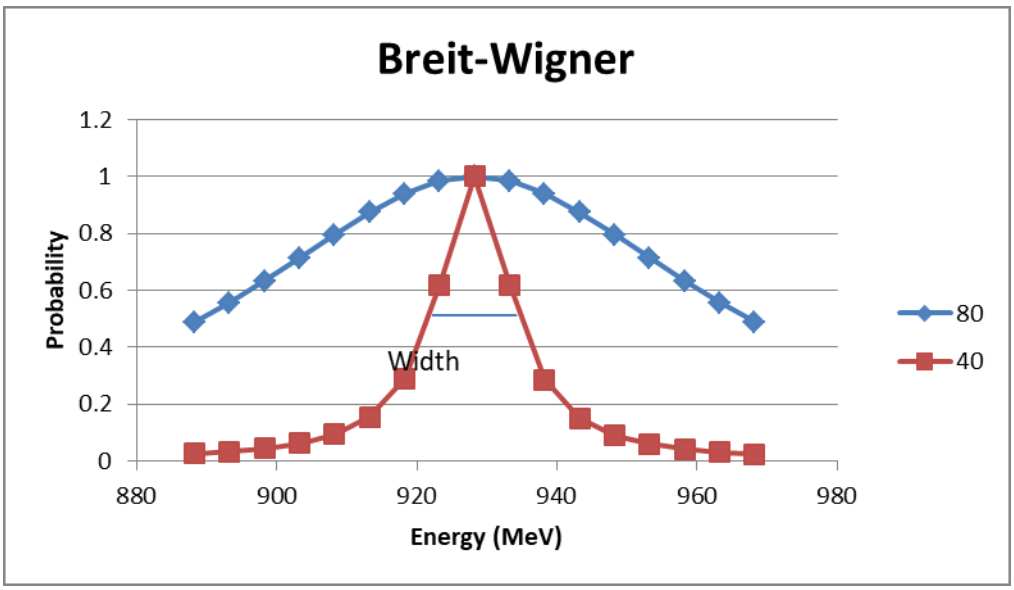
proton are resonances. Here is a model of one of the baryons. The kinetic energy resonances are designated as 2x, 3x, etc.



The high energy collision produces a baryon similar in form to the proton. The N(1520) baryon contains the same energy quarks plus resonances of energies that exist inside the proton. There are higher energy quarks and higher energy resonances in other baryons. The resonances present a decay path to lower energy because they are differences between quark energy. The PDG quarks masses are multiples of 0.622 MeV and decay to electrons, photons and kinetic energy. There are often other intermediate state baryons and mesons between total decay and baryon produced.

	Quark mas	Kinetic E		Field E				
	(MeV)	(Mev)		(MeV)				
strange	**101.95**					0.00		
DOWN	**4.36**					4.36		
-0.333		651.34		753.29	-0.333	1302.69	2x	753.29
		88.15				264.45	3x	
		9.44				18.88	2x	
		0.69		0.69		0.69		0.69
UP	**2.49**				UP	2.49		
0.667		88.15		101.95	0.667			0.67
	gluon!=99.	11.31				11.31		
		0.69		**0.69**		**0.69**		**0.69**
UP	**2.49**				UP	**2.49**		
0.667		88.15		101.95	0.667			101.95
		11.31						
		0.69		**0.69**		**0.69**		0.69
	Weak Field	-20.30				-101.50		
	Weak KE	0.00						
		0.00						
	Neutrino k	-0.67		0.74		-0.67		0.74
	ae neutrin	-2E-05					p+ and p- collison	
	E/M field	-2.72E-05						
charge 1	938.2721					1506.55	N (1520) 3/2− baryon	
electron	0.51	2.72E-05						
	electron k	0.11						
		-0.6224						
	electron n	2.02E-05						
	Neutrino k	0.67						
		0.74						
	expansion	10.15				-1506.55	Decay products	
	expansion	10.15						
	959.99			959.99		0.00		

The diagram on the right above is the temporary particle-space diagram for a collision between a proton and anti-proton. The proton contains energy values that become resonances in the baryon. In the example above they are 2x651, 3x88.5 and 2x9.44. The other values are the same. A major difference is the way the weak field forms. There are 5 resonances that each represents negative 20.3 MeV. Just like the proton, the total baryon energy equals the quarks plus resonances minus the weak energy. The simulated baryon mass is 1506.55 MeV well within accuracy reported by the Particle Data Group. The weak energy is a measurement known as the width energy. Five resonances simulate the width energy equal to 5*(-20.3 MeV/resonance)= -101.5 MeV. This simulation is also within reported measurement accuracy. The Breit-Wigner probability is 0.5 at width 101.5 MeV. Decay time is related to width with the simple relationship decay time= hbar/width= 6.58e-22/101.5= 6.48e-24 seconds. Breit-Wigner theory indicates that the wave function is unstable and the width becomes the decay rate.



The decay time for the baryon is 6.48e-24 seconds. Nature allows deviations from the proton norm but when the wave function collapses it discovers it is unstable the particle-space diagram returns to a wave function that collapses at P=1. Decay times can be understood with a model. The quark bundle orbits a radius of radius R=hC/(mass*width)^.5. The quark bundle travels around the circumferences at a velocity defined by half width. Circle time is exactly the decay time (the decay time convention should be = H/width). Similar calculations for a proton are shown below.

	R=hC/(m 20.3)^.5		
	2pi hC/((m+ke) 20.3)^.5/v		
	V/C=(1-((m-ke)/m)^2)^.5		
	circle time= 2 pi*R/V		
W (MeV)	20.3	-20.3	
	928.27	928.27	
	6.32E-15	undefined	
V/C	2.08E-01	undefined	
V m/sec	6.24E+07	undefined	
circle time	1.01E-22	undefined	seconds
h mev-sec	4.13E-21	4.13E-21	seconds
2pi h/W	1.02E-22	-1.02E-22	2pi h/w

All baryons except the proton and anti-proton decay at the circle time. The proton is stable because it has a P=1 wave function. All the diagrams show width E as a negative value. In the left column above circle time is calculated. This doesn't work for negative -20.3 MeV in the left column. We have to use the equivalent calculation on the right (H/-20.3= -1.02e-22 seconds). This indicates that weak energy is negative. This is a huge deal. Space programs have been proposed based on storing negative energy anti-protons and annihilating them with protons as an energy source. But there is negative energy -20.3 MeV *inside* the proton. Review the space portion of the proton-particle diagram below:

Weak Energy	-20.30			
Weak KE	0.00	equal and opposite		
Balance	0.00			
Neutrino ke	-0.67		10.51	0.74
ae neutrino	-2E-05			
E/M field	-2.7E-05			
938.27 Proton MeV				
	2.72E-05	0.296		
	-0.6224	-10.33		
0.5110	0.11	10.14		
electron neu	2.02E-05			
Neutrino ke	0.67	10.41		
	0.74			
expansion pe	20.29			
expansion ke	0.01			
959.99				959.99
Total N values		90.10	90.10	

The negative energy inside the proton is apparently the source of expansion kinetic energy plus expansion potential energy with 0=20.3- 20.3 MeV.

Keep in mind the possibility that V/C=(1-(m/(m+20.3-20.3))^2)^.5=0 if we consider all the energy in the proton. In other words, time is moving in a positive direction for the space portion of the diagram but part of the proton contains opposite and equal backwards time.

General concept: Perspective matters and if an object appears different perspective needs to be examined. Baryon properties like parity, charge and time directions are used to classify baryons but charge, parity and time conjugations are conserved. The fact that there is a stable anti-proton indicates that perspective of time is very real.

The source of space and time

Of particular interest in the proton-space model is the value 2.801 MeV, identified with the gravitational field energy. I believe this field energy is fundamental to time and space. The model below shows gravitational field components in yellow:

	Quark mass (MeV)	Kinetic E (Mev)			Field E (MeV)
DOWN	4.36	651.34			753.29
-0.333		88.15			
		9.44			
		0.69			0.69
UP	2.49	88.15			101.95
0.667		11.31			
		0.69			**0.69**
UP	2.49	88.15			101.95
0.667		11.31			
		0.69			0.69
	Weak Void	-20.30			
		0.00			
		0.00			
	Neutrino ke	-0.67			0.74
	ae neutrino	-2E-05			
	E/M field	-2.72E-05			
charge 1	938.2721				
electron	0.51	2.72E-05			
	electron ke	0.11			
		-0.6224			
	electron neut	2.02E-05			
	Neutrino ke	0.67			
		0.74			
	expansion pe	10.15			
	expansion ke	10.15			
	959.99				959.99
		2.801	Sum of yellow		2.801

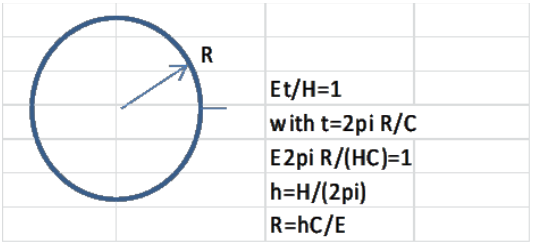
I find it significant that the value 2.801 MeV is both kinetic energy and field energy since the same total yellow values appear on the right and left hand side of the model. I associate this with a wave function component of the proton with probability=1. Together they are zero when proton-space forms an orbit. AE's happy thought was that in a falling elevator there is no gravity. For gravity the probability 1 condition is a Newtonian orbit (correct kinetic energy and radius for the central mass).

Relationship between field energy and a quantum circle

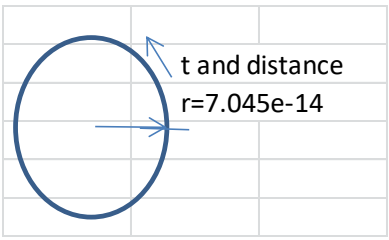
General relativity was a solution to a basic problem (action at a distance) in physics and is correct but it did not fully bridge the gap between large scale gravity and quantum physics.

The field energy 2.801 MeV is used to define a Schrodinger type wave function. A circle is used as a model with collapse of the wave function at P=exp(i*2.801*t/H)*exp(-i*2.801*t/H)=1.

Et/H=1 leads to R= quantum circle radius= HC/2pi=1.973e-13/2.8011=7.0445e-14 meters



Consider the possibility that space and time originate with a quantum circle related to the gravitational field energy 2.801 MeV.



Et/H=1 with t=2pi r/C leads to r=HC/(2pi)/E. H=Planck's constant=4.14e-21 MeV-sec. With R=7.04e-14, circle time= 2pi R/C= 1.47e-21 seconds. I consider this fundamental time.

Origin of the gravitational constant G

It is shown below that the gravitational constant G is simply a combination of values found in the proton-space model. The values are: kinetic energy 10.15 MeV, fundamental radius 7.045e-14 meters and the mass of protons (1.67e-27 kg). The N values in the model define the probability of one proton p=1/exp(90)*1/exp(90). Probability 1 is recovered with exp(180) protons (described more fully in the appendix).

The central protons curve space into a large sphere with radius 7.045e-14*exp(90)=8.59e25 meters.

G=20.3*1.6e-13*8.59e25/(2.49e51*1.67e-27)

G=6.69e-11 Nt m^2/kg^2

The value 1.6e-13 Nt-m/MeV in the equation is a conversion constant. The large numbers can be combined into the factor 1/exp(90). This yields the relationship below between two protons.

G=10.15124*2*7.045e-14*1.602e-13/EXP(90)/1.675e-27^2			
6.69E-11	Grav Const Nt m^2/Kg^2		

The factor 1/exp(90) is recognized as a bridge between large scale Newtonian physics and the quantum scale since the proton model is for one proton. With ke=10.15 MeV and r0=7.045e-14, the equation above can be used to define how the radius of a cell changes with kinetic energy. A cell is the space that one proton defines. Newtonian gravity is in complete alignment with the concept of particle-space. With G constant fundamental radius r0 can expand with kinetic energy inside space part of proton-space.

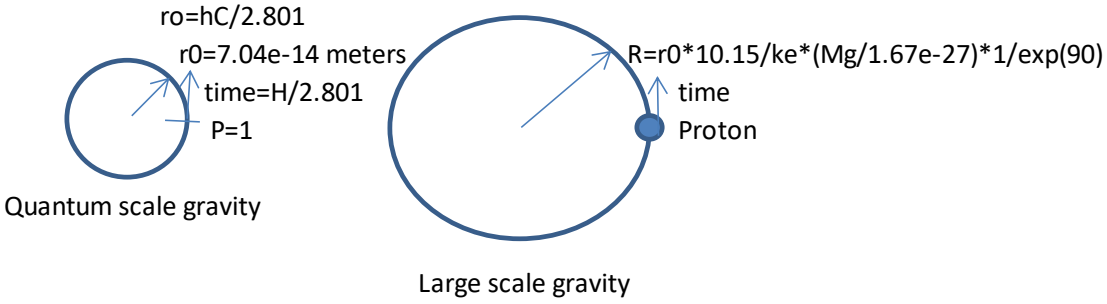
G=2*ke*r0/m^2*1.6e-13	
G=G as R increases	
2*10.15*r0/m^2= 2*ke*R/m^2	
10.15*r0= ke*R	
R=r0*10.15/ke	

This means that the proton-space model is more descriptive than Newtonian gravity because kinetic energy is a property of the proton, not just some random V, The above relationships can be further expanded as follows;

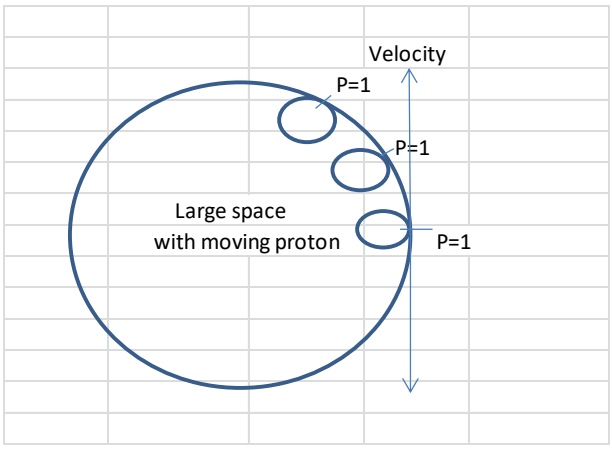
Orbital R for galaxy= GM/V^2 where M is the central mass
substitute G=r0 v^2/m*(1/exp(90))
R= r v^2/m*(1/exp(90))*M/V^2
v^2/V^2=1 (cell v and large V equal)
m/M=m/(m*number of cells in galaxy)
R= r*(1/exp(90))*M/m
multiply top and bottom by exp(180)
R=r*exp(90)*M/(m*exp(180))
m*exp(180)=Muniverse
R=r*exp(90)*(Mgalaxy/Muniverse)
r=r0*10.15/ke=7.04e-14*10.15/ke
R=7.04e-14*10.15/ke*exp(90)*(Mgalaxy/Muniverse)
R=r0*10.15/ke*(Mgalaxy/1.67e-27)*(1/exp(90))

An equivalent defining relationship for G is included in Appendix 3.

Relationship between the quantum scale and large scale gravity



R in the diagram on the right is another way of writing R=GM/V^2. It can be used to give the radius a proton would orbit any central mass. For example, Mg could be the mass of a galaxy. The two diagrams can be superimposed below to understand what is occurring when a proton moves through space. Fundamental time is one time around the quantum circle =2*pi()*7.04e-14/C=1.5e-21 seconds. As a particle moves around a large orbit the particle itself only fully exists at P=1 according to the Schrodinger equation. We can put the P=1 points around the circle. Imagine that the small circles roll around the large circle marking increments of time. Would we really know if time is not smooth?



The particle and its ability to define time are moving around the circle in increments of 1.5e-21 seconds. The curvature in the diagram above is defined by the proton as it moves because it defines the gravitational constant G. The particle can move at different velocities (different amounts of kinetic energy). But its gravitational relationships always obey the equation R=10.15*ro/ke*(central mass/1.67e-27)*1/exp(90). This equation is another way of relating the important variables (central mass M, Velocity (though ke) and R). This is the source of gravitational relationships like R=(GM/V^2). Fundamental energy values are inside the proton, specifically the kinetic energy value 10.15 MeV and the gravitational field energy 2.801 MeV.

A new concept of velocity

It is important to recognize that a moving proton is not changing fundamental time. Gamma is calculated for the proton on the circle with gamma= m/(m+ke). It is simply a ratio of mass to mass and kinetic energy added together. Combining mass and kinetic energy doesn't change the time since the proton alone establishes the time increments. The proton energy 2.801 MeV establishes time increments based on P=1. This occurs every 1.47e-21 seconds.

V=C*(1-(gamma)^2)^.5 but C is R=2 pi* fundamental distance/fundamental time. These are placed in the equation below (1.47e-21 sec=H/2.801 where H= Planck's constant and r=7.045e-14 meters).

```
V=2*PI()*0.00000000000007045*((1-gamma^2)^.5)/1.47E-21
```

As always if gamma=1, V=C and if gamma=0, the particle is stationary from our perspective. Gamma is a modifier that changes the rate at which P=1 occurs. It is a time ratio but it is not changing fundamental time.

Do we have enough information to resolve the rocket launching rockets situation? Nature is proton-space centric. I believe that the base of each arrow is a proton that defines space around it. From its perspective, it is stationary and we can only place our perspective at the beginning of each arrow because we are made of protons. Time is uniform throughout nature because velocity does not change time. From our perspective the rate at which P=1 occurs is changed and we see the rocket move. If unrestrained the protons will naturally exist in Newtonian orbits they define.

Creation of large distances

From the standpoint of the proton-space model, only two values change as the universe expands. Kinetic energy is being converted to potential energy, i.e.: The kinetic energy can change but ke= 20.3-potential energy.

938.27	MeV Proton			
	2.72E-05	0.296		
	-0.6224	-10.33		
0.5110	0.11	10.14		
electron neu	2.02E-05			
Neutrino ke	0.67	10.41		
	0.74			
expansion pe	20.29			
expansion ke	0.01			
959.99				959.99
Total N values		90.10	90.10	

The wave function for each proton is intact because the total remains 959.99 MeV. Since kinetic energy has been converted to potential energy and the particles are now a long ways apart. The initial kinetic energy has been converted to potential energy resisted by gravity. I find it significant that the expansion equations involve time; i.e. below we use R/r=(t'/t)^(2/3). In other words components that add to 20.3 MeV are directly associated with the distance between particles. Cosmologists have long known that space is created by expansion. One proof of this is that early in expansion velocity calculations without the concept of particle space allows velocities many, many time C and this is non-physical.

Expanding cells maintain G

Understanding that the gravitational constant G can be calculated with ke0= 10.15 MeV/proton of kinetic energy in a cell of radius r0= 7.045e-14 meters allows further development of cellular cosmology gravitational relationships before thermodynamics starts to dominate. As kinetic energy decreases and potential energy increases each cell expands. Kinetic energy associated with each of exp(180) cells is related to pressure acting outward on the surface. Consider how kinetic energy and potential energy change in the derivation below. Kinetic energy (ke) is be turned into gravitational potential energy (pe=Fr) over time. The increasing radius of the universe and increasing time are related through expansion.

Kinetic E	Potential
ke	F r
1/2M(v)^2	GMM/r
1/2M(r/t)^2	GMM/r
1/2Mr^3/t^2	GMM
1/(2GM)*r^3	t^2

(r/r0)^3 increases as (t/t0)^2

(r/r0) increases as (t/alpha)^(2/3) (kinetic energy requirement).

Returning to the basic concept that particles define space locally, the above equations indicate that time is changing two things simultaneously. 20.3 MeV= ke+pe. Combining the equations above:

(r/r0)=(t/alpha)^(2/3)
With r= r0*10.15/ke
r/ro*10.15/ke= (t/alpha)^(2/3)
ke=10.15/(t/alpha)^(2/3)
pe=20.3-10.15/(t/alpha)^(2/3)

These can be substituted into the space portion of the model as follows:

	2.72E-05	0.296	
	-0.6224	-10.33	
0.511	0.11	10.14	
electron n	2.02E-05		
Neutrino k	0.67	10.41	
	0.74		
expansion	ke=10.15/(t/alpha)^(2/3)		
expansion	Pe=20.3-ke		
939.68			959.99
Total N values		90.10	
r=7.045e-14*10.15/ke			

With this understanding the proton model describes expansion with time. Since time is defined by the proton and it also contains expansion kinetic energy, the proton becomes a cosmological particle with the full capability of creating the universe we see around us. Proton-space is a cosmological model.

			Start	He4 transition	He4 Spike	Now	
KE MeV			10.15	0.099	2.81E+00	3.33E-10	
KE expansion algorithm			10.15*(0.0511/time)^.5		2.81*(539/time)^0.666		
Expansion Time (sec)		Time (sec	0.052	539	539	4.32E+17	
Temp before He4 spike K=ke/(1.5*B)			7.87E+10	7.66E+08		0.35	settle back r
R meters=8.05e12*10.15/(E*pi)			8.04E+12	8.26E+14		R=4.21e15*2.81/(3.33e-10)	
R after spike=8.23e14+2.8*1.6e-13/(3.6e-42*exp(90)*exp(60)					1.20E+16	3.55E+25	
Temperature after He4=KE/(1.5*B)					2.18E+10	2.58	
baryon photon ratio					6.98E-10		
		Stars energy delta radius (m)				4.5E+24	
		Temperature now (K)				2.73	
		Radius end of expansion (m)				4.00E+25	

The table above is a summary of expansion based on energy values in the proton-space model. This is fully discussed in references 11 and 13. Expansion starts based on ro=7.045e-14*exp(60) meters (exp(180) particles in three dimensions). The original expansion energy 10.15 MeV and associated temperature decrease until the temperature associated with 0.111 MeV is reached. This value is found in the proton model as 0.662 MeV-0.511 MeV= 0.111 MeV. Neutrons and protons are in equilibrium at the beginning but neutrons start to decay with a half time of 661 seconds. There are enough neutrons remaining at energy 0.111 MeV to readily react with protons. About 25 percent of everything becomes He4. This spikes the temperature but as expansion continues it falls to near present values. The proton energy values and its gravitational relationships create the cosmology we observe over time. A comparison was made with finding of WMAP [18]. There are substantial differences that were addressed in reference 13.

Missing matter

The analysis below does not assume dark matter, nor does it violate Newtonian gravitation. In the table below the distance from the center of a galaxy to edge is the vertical axis. The bottom line is the orbit at 2.58e20 meters that everyone agrees should have 228000 m/sec because it is calculated from conventional Newtonian gravity. But potential problems arise as distance increases (shown in the lines above the bottom line) because many think that Newtonian gravity dictates that velocity should decrease with distance from the central mass. They add "missing matter" to calculations in an effort to keep the problem from occurring. Their problem is that actual measurements show flat velocity curves.

Below, the kinetic energy column on the left is for Newtonian orbits. According to the theory presented above, a column labelled potential energy is placed next to the kinetic energy with potential energy plus kinetic energy a constant. This resolves the missing matter problem.

This can be translated to the measurements we make. The only way we have of measuring the velocity profile is by measuring gamma. We can assign gamma to energy with the equations: gamma1=m/(m+ke) and gamma2=m/(m+pe). We measure constant gamma and this means velocity is really constant, exactly what the theory proposes according to the calculations below for gamma. There is no need for missing matter [20][13].

multiples of			ke long	ke	PE	gamma	V
2.58E+20	ke	pe	1-gamma	redshift	redshift	meas	
10	**2.71E-05**	2.44E-04	2.87E-08	2.89E-08	2.60E-07	2.89E-07	228131
9	**3.01E-05**	2.41E-04	3.19E-08	3.21E-08	2.57E-07	2.89E-07	228131
8	**3.39E-05**	2.37E-04	3.59E-08	3.61E-08	2.53E-07	2.89E-07	228131
7	**3.87E-05**	2.32E-04	4.11E-08	4.13E-08	2.48E-07	2.89E-07	228131
6	**4.52E-05**	2.26E-04	4.79E-08	4.82E-08	2.41E-07	2.89E-07	228131
5	**5.42E-05**	2.17E-04	5.75E-08	5.78E-08	2.31E-07	2.89E-07	228131
4	**6.78E-05**	2.03E-04	7.18E-08	7.23E-08	2.17E-07	2.89E-07	228131
3	**9.04E-05**	1.81E-04	9.58E-08	9.64E-08	1.93E-07	2.89E-07	228131
2	**1.36E-04**	1.36E-04	1.44E-07	1.45E-07	1.45E-07	2.89E-07	228131
1	**2.71E-04**	0.00E+00	2.87E-07	2.89E-07	0.00E+00	2.89E-07	228131.0

The result above indicating that the gravitational field energy is always balanced explains observations without assuming missing matter. Each proton falls into an orbit based on kinetic energy it receives by

falling from the expansion determined potential energy with ke+pe= 20.3 MeV. The protons are falling because mass is accumulating and forming stars. This star velocity will naturally be V= (GM/R)^.5 with V determined by kinetic energy plus potential energy combinations specific to each R. Each proton, regardless of which star they are in, obeys R=r0*10.15/ke*(central mass/1.67e-27)*1/exp(90) because this is built into each proton and collectively they curve space appropriately. All gravitational orbits are natural and follow Newtonian gravity as long as the total energy is constant. There are situations where some energy is missing due to particle interactions (discussed below).

Weak Energy	-20.30			
Weak KE	0.00			
Balance	0.00			
Neutrino ke	-0.67		10.51	0.74
ae neutrino	-2E-05			
E/M field	-2.7E-05			
#REF!				
	2.72E-05	0.296		
	-0.6224	-10.33		
0.5110	0.11	10.14		
electron neu	2.02E-05			
Neutrino ke	0.67	10.41		
	0.74			
expansion pe	20.29			
expansion ke	0.01			
959.99				959.99
Total N values		90.10	90.10	

Examples involving relativity

There are several examples frequently cited as proof of relativity. Consider how these change if we view particles-space as a manifestation of proton energies.

Time shifts related to position in a gravitational field

The proton-space model of a particle can have extra values as long as they are balanced between the proton and the space portions. Below it will be shown that this is the reason we feel a force standing on earth.

Measurements indicate that time varies with gravitational position above the earth according to accepted equations. The [Wiki] equation:

$$t_0 = t_f\sqrt{1 - \frac{2GM}{rc^2}} = t_f\sqrt{1 - \frac{r_s}{r}}$$

The radius below is the Schwarzschild radius.

r s = 2 G M / c^2.

But escape velocity for a massive body is (2Gm/r)^.5=V or 2Gm/r=V^2.

Escape velocity can be substituted into the gravitational shift equation and simplified to: t0/tf=(1-2GM/(rc^2))^.5= (1-(V/C)^2)^.5.

The explanation I heard for light not escaping a black hole was that the light could not escape because it did not exceed the escape velocity. But light speed velocities are not additive or subtractive. Escape velocity for a massive body is V= (2Gm/r)^0.5.

If we use the Newtonian equation for orbital velocity we can find the velocity orbiting a black hole.

V=(GM/R)^.5	
r=rs=2Gm/C^2	
r=GM/C^2 if light is not escaping	
V=(GM/(GM/C^2))^.5	
V=C	

I believe the correct explanation is that the light follows the curvature of the event horizon. This may be a subtle difference but does time really stop as suggested by the first equation above (t/tf=0)?

Gravitational shift in low energy orbits like the earth

For stars orbiting in a galaxy it was pointed out above that high velocities exist from center to edge. The velocity originated from the kinetic energy gained (accompanied by potential energy loss) when the mass fell from the expansion determined radius. But planets orbiting the sun have different velocities.

M sun (Kg)	1.99E+30								
	Mercury	Venus	Earth	Mars	Jupiter	Saturn	Uranus	Neptune	Pluto
Vel (m/sec)	47917	35121	29944	24429	14919	14245	19953	31153	43688

It was pointed above that all gravitational orbits are “P=1”, natural and allowed since Newtonian relationships are built into each proton.

Planets formation involves many collisions and kinetic energy is converted to temperature. One can think about the position in a gravitational field as the velocity (kinetic energy) required to reach a geodesic (the path a Newtonian orbit requires). The effect has not been lost on popularizes of relativity that point out we age differently at sea level compared to the top of a mountain. But consider the energy history of the proton; the table below:

Expand: Cells expand from 7.04e-14 meters for 13 billion years. The cell radius expanded to 0.35 meters and the associated proton’s kinetic energy decreased from 10.15 MeV/proton to around 2e-12 MeV. The original total of 20.3 is almost all potential energy. This value is slightly low because there were two events (primordial nucleosynthesis and energy release from stars) that increased the energy available. The actual temperature now is 2.73K.

Fall: Gravitational accumulation reverses the process toward the end of 13 billion years. Now read the table from the top down. As a proton falls from its expansion determined potential energy position and

enters an orbit around the earth it has half the escape velocity (11190/2=5592.0 m/sec). This is a kinetic energy gain of about 1.6e-7 MeV. This energy can be converted to temperature with the Boltzmann relationship (T= ke/(1.5 B where B=8.6e-11 MeV/K). The temperature is about 5000 K. Incoming mass from space impacted the developing earth and kinetic energy was converted to temperature. Protons with their cells (inside rocks) become compressed to a radius of about 5e-11 meters. They would compress further without electromagnetic field resistance. This compression converted to kinetic energy is 0.013 MeV/proton or 1e8 K. Hot earth cooled due to radiation to space and the core of the earth now is only 5700 K. The kinetic energy associated with 5700 K is 7.3e-7 MeV.

From the proton's viewpoint on earth it gained 1.6e-7 MeV from the fall but when it impacted the earth this kinetic energy was eventually converted to about the same MeV of temperature. The proton is small and bounces around with this temperature. But it lost 1.6e-7 MeV of potential energy. Our accounting system says overall temperature was gained but potential energy was lost. But escape velocity for a massive body is (2Gm/r)^.5=V or 2Gm/r=V^2 and escape velocity can be substituted into the gravitational shift equation and simplified to: t0/tf=(1-2GM/(rc^2))^.5= (1-(V/C)^2)^.5.

The escape velocity is the velocity the proton needs to be in its natural orbit. Energy values in the proton define the gravitational relationship R=r0*10.5/ke*(Mcentral/1.67e-27)*1/exp(90). The central mass is the earth but the ke value is only ¼ of the kinetic energy it needs to be in orbit (ke=1/2 m*V^2 with V only half of orbital velocity). Energy values in the proton probably adjust to this situation. The particle-space model tries to predict these changes.

	2.72E-05	0.296		
	-0.6224	-10.33		
0.5110	0.11	10.14		
electron neut	2.02E-05			
Neutrino ke	0.67	10.41		
	0.74			
Matchin PE	0.00			
excess pe	1.60E-07			
expansion pe	20.29			
expansion ke	0.01			
missing ke	-1.60E-07			
959.99				959.99
Total N values		90.10	90.10	

This causes acceleration of the protons in my body because they are off the geodesic and don't have enough kinetic energy to be in their "P=1" orbit. I feel gravity because I am missing1.6e-7 MeV of kinetic energy, i.e. a=GM/R^2. But there is also excess potential energy. If the earth were not in the way, the protons would seek a new orbit by falling. They would again establish P=1. Gamma for the missing energy is gamma= (1-(v/c)^2)^.5 and v is 5592 m/sec. Gamma is small and 1-gamma=1.7e-10. Missing V can also be represented by gamma as shown below.

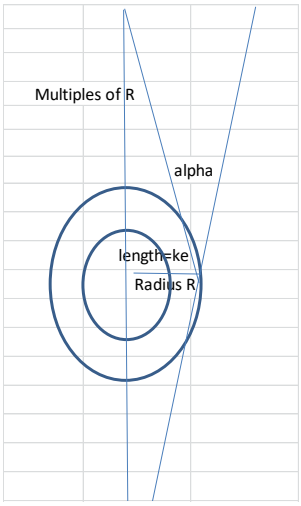
V=2*PI()*0.00000000000007045*((1-gamma^2)^.5)/1.47E-21

This was the relationship that keeps fundamental time 1.47e-21 seconds constant. P=1 repeats in increments of 1.47e-21 seconds. The more often P=1 occurs, the higher the velocity. In other words (1-g^2)^0.5 modifies C. Time shrinkage is real and has been measured but it is a slight energy rebalancing inside the proton associated with acceleration. The proton field energy 2.801 MeV that establishes fundamental time is not affected. With correct energy accounting the diagram shows overall energy 20.3-20.3= 0 and total energy 959.99 MeV.

Review: Proton-space is associated with P=1 when it is in a gravitational orbit. The proton has gravitational acceleration associated with it when its energy values are balanced slightly differently.

Gravitational Lensing

In the section above, it was shown that light can actually "orbit" if the mass is a black hole. This helps understand the less severe case of light approaching mass from the back side and being deflected in what is called gravitational lensing. The equation (Einstein) developed is alpha= 4GM/R^2 [Wiki]. The angle alpha is shown below:



Why is light deflected? Rewrite the equation above:

V^2/R=4GM/R^2	
8*(Ke/1.67e-27)/R=4GM/R^2	

The deflection length= (8*ke/1.67e-27)/R is on the above diagram. Dividing length by multiples of the radius R gives angle alpha. It appears that light is partially following the curvature of space since the radius of concentric circles become smaller as light approaches the mass.

M Mass (kg)		2.00E+41		2.00E+30
R orbit=GM/V^2 (m)		2.58E+20	alpha	6.96E+08
		Galaxy	4GM/R^2	
		(8*ke/1.67e-27)/R		(8*ke/1.67
	10	7.88E-12	8.03E-12	1.08E+01
	9	9.73E-12	9.92E-12	1.33E+01
	8	1.23E-11	1.26E-11	1.69E+01
	7	1.61E-11	1.64E-11	2.21E+01
Multiples	6	2.19E-11	2.23E-11	3.00E+01
of R	5	3.15E-11	3.21E-11	4.32E+01
	4	4.93E-11	5.02E-11	6.76E+01
	3	8.76E-11	8.92E-11	1.20E+02
	2	1.97E-10	2.01E-10	2.70E+02
	1	7.88E-10	8.03E-10	1.08E+03

The extreme case for a black hole presented above shows that light actually does "orbit" by following the curvature. Here are the comparisons using alpha and (8ke/1.67e-27)/R. Note that alpha is 150 radians at 2*rs, meaning that light is deflected around the circle.

	2.00E+41	Black Hole Mass (Kg)	
	2.96E+14	rs=(2GM/C^2) meters	
		Alpha radians	
	(8*ke/1.67e-27)/R		Ke-MeV
2	149	152	**1.18E+02**

Proton-space adds understanding: Space is always curved by mass (r=gm/v^2). It is only curved enough for light to orbit with v=C in the above equation. Light is partially deflected by curved space according to 4GM/V^2.

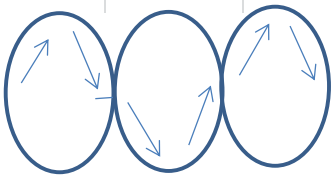
Physics for light

Light speed is the constant relationship between space and time. There are "light cone" diagrams involving space and time [1][2] that indicate limits but they are often quoted and misleading because they assume that fundamental time is different throughout space. Light and time can be understood as follows: The gravitational field defines space and time and light moves through that space.

Time is measured around a circle of radius r
r=hC/E, where E=2.801 MeV
it is stationary because we move with time
t=2*pi*r/C
d=2*pi*r
The speed of light is the ratio distance/time
C=d/t

You cannot travel at C; you are forced to adopt the protons sub-luminal perspective.

Light and time



Light is a moving quantum circle
E=H/t where C=3e8 m/sec and t is time around the circle
t=H/E where E is electromagnetic energy.

Time advances in multiples of these fundamental time increments. Light energy is established by the proton by its definition of electromagnetic energy E=2.7e-5 MeV. From our perspective it has a different relationship with time. This is similar to the example above regarding the anti-proton. The anti-proton's time direction has been reversed. For light, time has been stopped. It has energy E=hv from our perspective.

Is momentum fundamental?

The relativity equation E^2= M^2+(PC)^2= E^2 is correct but it can be written E^2 =(M+ke)^2 where E^2 represents equal and opposite (field energy E)^2. The left hand side of the proton-space model E^2= (M+ke)^2 accounting system leaves a lot of flexibility for various kinds of energy to exist (mass, kinetic energy, temperature, fusion energy, potential energy, chemical energy, entropy, etc.). Many are energy quantities, energy=hv, where v is frequency. This does not change fundamental time. It is uniform throughout the universe and allows E=hv to be uniform. Time passes in increments of fundamental time defined by the moving proton. The energy forms above are mainly different forms of kinetic and potential energy. Changing from one form to another does not change the overall energy of proton-space, fixed at 959.99 MeV. But P=mV and velocity can be perspective dependent. To avoid perspective errors we should prefer to use the equation:

(M+ke)^2= E^2 where E^2 is equal and opposite field energy.

Gravitational action at a distance

Above we said "The central protons curve space into a large sphere with radius 7.045e-14*exp(90)=8.59e25 meters".

G=20.3*1.6e-13*8.59e25/(2.49e51*1.67e-27)

G=6.69e-11 Nt m^2/kg^2

Do you find it surprising that the definition of G means a proton that is 8.6e25 meters away from central mass knows what curvature to follow? If this is not surprising you probably accept the concept that gravitation and space is a collective property of nature. The protons are identical and each contains energy values that define gravity and space. But unless we use the concept of proton-space, protons are independent and can move anywhere. The concept of proton-space allows them to coordinate their behavior because they share the same space. The examples below use the same concept.

How about double slit interference observation?

This of course involves the appearance of an interference pattern on a screen that receives energy from two separated slits. Measuring which beam caused the interference changes the pattern and we wonder

why our perspective matters. Two perspectives interfere before measurement, one for each angle. It is encoded in the kinetic energy they receive as the phase of each wave direction. Our perspective is outside the screen but we are in the same world. This is similar to the world view change required when we change a proton to an anti-proton. We flip the proton to an anti-proton and our perspective records the change as backwards time because we share the same space. Applying this to the interference observation we say: "Measuring the slit the energy went through selects one perspective and our perspective records the change because screen protons and my protons share the same space".

Schrodinger's Cat?

A live or dead cat results from a random event in this example. But the question is what is in the box before you observe it. This again is an example of the interference of two possibilities. You don't know the result until the box is opened and have the perspective that that either/both could be true. Opening the box selects an alternative but also selects which of two world futures it belonged to. The perspectives are linked because the cat's protons and my protons share the same space.

Action at a distance?

The initials EPR will remind physics readers of the experimental setup. This results challenge our concept of distance. This is another example of two perspectives that interfere. The resolution is the same. "The two beams exist in the same space and are linked". In this case it is a statistical linkage because of phases.

Further thoughts

The last three examples are different than just insisting on a particle-space energy accounting system that always equals 960 MeV. Energy values inside the proton causes nature to follow uniform laws locally based on uniform time. The last three examples seem to indicate that there is one wave function that only appears to be divided into many, many particles. If we didn't have to adopt a perspective that depends on the protons that make up our bodies and minds would we have a global perspective?

Conclusion

The proton-space concept increases our understanding of nature. Proton-space is defined by the energies inside the proton. It is stable because the associated Schrodinger wave function is 1.0. The proton energies are quarks and resonances. All baryons including the neutron and baryon follow the same rules. High energy experiments increase the resonance energy and allow us to simulate their mass. All baryons contain negative weak energy, directly related to decay rate for unstable wave functions. The negative weak energy of the proton is related to its expansion and kinetic energy, properties of the space the proton defines.

Fundamental space and time are defined by a field of value 2.801 MeV. The gravitational constant G is defined by this value and the initial expansion kinetic energy value 10.15 MeV. This gives the proton cosmological properties able to curve space and find combinations of velocity, radius and mass that form orbits. Gravitation is constant but the total of expansion kinetic energy plus potential energy is constant at 20.3 MeV. Expansion radius increases with (t'/t)^(2/3), making the proton energy changes a cosmological particle defining the universe around us.

Time passage that we experience is based on counting increments of fundamental time. Particles move without changing fundamental time. This provides an unchanging energy foundation for the universe. Velocity is redefined in particle space according to the following equation:

$$V=2*PI()*0.00000000000007045*((1-gamma^2)^.5)/1.47E-21$$

Gamma becomes a modifier that determines velocity by changing the way the wave function probability 1 points along a path change. The probability 1 points are defined as R=2pir*fundamental space and fundamental time 1.47e-21 seconds.

The protons ability to establish Newtonian orbits while keeping potential and kinetic energy constant explain why stars orbit galaxies at almost constant velocity. There is no missing matter.

Time does shift locally for protons unable to move to their Newtonian orbits. This is the case for protons that make up solid bodies like the earth. They shift their kinetic energy and potential energy slightly resulting in acceleration. The total proton-space energy of 959.99 MeV is not affected by this adjustment.

Light is deflected slightly around large massive bodies, an effect known as gravitational lensing. For black holes the deflection is so great that the light orbits the black hole at the event horizon.

There are many observations in physics that can be better understood if perspective is a real property of nature. For example time moves backward for anti-protons; quarks become anti-quarks; spin, charge and time conjugate, etc.

The author is not questioning the most important tenets of relativity. General relativity agrees with the particle-space view of gravity. It is curvature of space time. But the proton-space view imbues the proton with the capability to find orbits and dictate expansion. It is a cosmological particle. This property appears to bridge the gap between the proton quantum level and large scale space and time.

One aspect of special relativity that I believe needs revision is the concept of time shrinkage. It may exist locally but unless the universe has a uniform time base energy, particles would be different from one another based on their velocity or placement in space.

Particle space appears to present alternatives for our understanding of quantum mechanics. Dual slit interference, EPR connections and Schrodinger's cat are examples of the need for space to be an integral part of nature, not just some independent feature that particles move through.

The proton model becomes especially productive for cosmology. It provides the following:

1. The kinetic energy/proton associated with the big bang (10.15 MeV).
2. The original radius of the universe (exp(60)*7.045e-14 meters).
3. The way cell kinetic energy (KE) changes with time: KE'=10.15*(t/t')^(2/3).
4. The way cell radius changes with R=7.045e-14*KE/ke meters.
5. The temperature at which primordial nucleosyntheses occurs (0.11 MeV), the kinetic energy difference between 0.622-0.511 MeV in the model.
6. The fusion release and the spike temperature that gives the required baryon/photon ratio (consistent with isotopes that are uniformly measured throughout nature and associated with the H→He4 transition.)

7. The mass density at equality and decoupling, leading to consistency with WMAP analysis of CMB.
8. It allows us to calculate the forces involved in late stage expansion. Energy release by stars seems to account for recent flattening of the expansion curve.
9. The simplicity of the model indicates that everything is based on a fairly simple equation, the Schrodinger equation [12][14].

The big "take away" from this work is that energy values in the proton model help us understand nature. Our currently understanding is based on a Standard Model. There are many similarities between this work and the model. Reference 15 explored these similarities. When light speed wave functions like those defined by the proton model are considered, we understand that mass+kinetic energy exp(Et/H) must be multiplied by exp(-Et/H), remain equal (E-E=0) and overall unchanged.

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Appendix

Details of the proton model

Probability=1/exp(N) is written below in tabular form. Information = negative natural log(p1*p2*p3, etc.) = 90.1 is written at the bottom of each fundamental N column. With these probabilities, the components become parts of the N=90 information system.

	N	P=1/exp(N)	N	P=1/exp(N)
Quad 1	**15.43**	1.99E-07	**17.43**	2.69E-08
	12.43	3.99E-06	**10.43**	2.95E-05
Quad 2	**13.43**	1.47E-06	**15.43**	1.99E-07
	12.43	3.99E-06	**10.43**	2.95E-05
Quad 3	**13.43**	1.47E-06	**15.43**	1.99E-07
	12.43	3.99E-06	**10.43**	2.95E-05
Quad 4	**10.41**	3.02E-05	**-10.33**	3.07E+04
	-10.33	3.07E+04	**10.41**	3.02E-05
Quad 4'	**10.33**	3.25E-05	**10.33**	3.25E-05
	0.00	1.00E+00	**0.00**	1.00E+00
	P1*P2*etc	8.19E-40		8.19E-40
	ln (Ptotal)	90.00		90.00

The next level involves placing the probabilities in the Schrodinger equation to produce the neutron and proton.

Probability 1=e0/exp(N). This probability is an energy ratio and leads to the equation E=eo*exp(N). The probability is 1/exp(N) and e0=1 in natural units or 2.02e-5 in MeV units, evaluated from the electron N from the table in Appendix 1.

Energy zero= 0= E-E. Energy is created by a separation but there are two types of energy. Appendix 2 explains how energy separations from zero and probability 1 represent the neutron and proton. Probability 1 represents the other initial condition, zero information. Everything was apparently produced by separations. The components of the neutron and its fields encode the laws of nature. It means that there are particles separated in distance, each with kinetic energy for expansion of the universe.

The work below derives Schrodinger based orbits that obey energy zero. This means there will be positive and negative energy terms created through separation. This E=0 constraint and related P=1

constraint are further defined. There are sets of four probabilities of interest that contain exponential functions 1/exp(N).

Evaluating E

Evaluating E in the RHS requires consideration of overall probability, not just the probability of particles. Initially there was a probability for many neutrons to make up the universe. Specifically, P= 1= probability of each neutron* number of neutrons= 1/exp(N)*exp(N).

1=1/1=exp(180)/(exp(90)*exp(90)) where exp means the natural number e to the power 90, where 90 is a base 10 number (count your fingers).

Number of neutrons in nature

Based on the neutron model the components of mass plus kinetic energy add to N=90.0986. I used N=90 in early work and haven't resolved the 0.0986 difference. With P=1/exp(90) and equally improbable field energy components, the probability of the neutron is 1/exp(180) since probabilities multiply. If P=1, there are exp(180) neutrons in nature. These are apparently placed outside of each other to prevent nature from occurring as one large superposition. Is this the origin of the Pauli exclusion principle? The value exp(180) agrees with estimates of critical density but P=1 is difficult to accept. Does this mean there is one neutron expressed as exp(180) low probability duplicates throughout nature? I consider it a system but know this is difficult to accept.

The probability of each neutron is 1/exp(N). The neutron itself is made of improbable components like quarks. Appendix 2 uses the logarithmic values called N values for probabilities to produce an alternative table of the neutron model. The probability of particles that makes up the neutron are energy ratios, i.e. p=e0/E=1/exp(N), where e0 is a small constant. Eo is evaluated with data for the mass of the proton 0.511 MeV and its known N value 10.136 [appendix]. This means the set of N values gives the energy of its components through the equation E=e0*exp(N).

Information theory probabilities

C. Shannon [10] 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.

p=e0/E=1/exp(N), i.e. E=e0/p.

With p=1/exp(N), E=e0*exp(N).

E1-E1+E2-E2+E3-E3+E4-E4=0
Identify E as E=e0*exp(N), using the same N values as the LHS.

0=eo*exp(13.431)-eo*exp(13.431)+e0*exp(12.431)-e0*exp(12.431)+e0*exp(15.431)-e0*exp(15.431)+eo*exp(10.431)-e0*exp(10.431)

Mass plus kinetic energy will be defined as positive separated from equal and opposite negative field energy. E1 is the only mass term, E3 and E4 are field energy and the remainder is kinetic energy.

E1+(E3+E4-E1-E2)+E2-E3-E4=0 (rearrange)
E1 is mass, (E1+E4-E1-E2)+E2 is kinetic energy.
E3 and E4 are equal and opposite field energies
mass1 + kinetic energy- field energy3-field energy4=0

The four N values discussed in the section entitled "Evaluating E" and their associated energy is called a quad. It is defined as the E values E=e0*exp(N) in a box to the right of each N value. The key to distinguishing mass (E1) from kinetic energy (E2) and two fields is shown below. The positions are not interchangeable.

Mass	Field 3
Kinetic Energy	Field 4 (G)

		mev			mev		
		E=e0*exp(N)			E=e0*exp(N)		
N1	13.43	13.8	E1 mass	N3	15.43	101.95	E3 field
N2	12.43	5.1	E2 ke	N4	10.43	0.69	E4 field

E1=2.02e-5*exp(13.43)=13.79, E2=2.02e-5*exp(12.43)=5.08, E3=2.02e-5*exp(15.43)= -101.95, E4=2.02e-5*exp(10.43)= -0.69 (all in MeV).

Separation of energy from zero

Overall E1+(E3+E4-E1-E2)+E2- (E3-E4) =0= (E1-E1)+(E2-E2)+(E3-E3)+(E4-E4) obeys the energy zero restriction. I call these diagrams energy zero, probability 1 constructs. They contain energy components of a quark.

Repeating the process for the quark quads and quads that lead to the electron yields the proton model in the text [11][12].

Comparison of proton model and PDG data

Compare the above values for the neutron and proton with measured values.				update feb 2017					
931.4940281	nist		0.510998946	0.510998946					1.30E-07
931.4940955	pdg	548.5799095	0.51099895		0.5110011		-2.15856E-06		2.40E-07
simple cell g67	Data		Data (mev)		Calculation (mev)	calculation	Difference	Difference	measurement
			Particle Data Group		Present model	(amu)	(mev)	(amu)	error (amu)
		(amu)		(an	(mev)				
Neutron	nist	1.008664916	939.5654133	939.5654135	939.5654127	1.0086649	5.629623E-07	8.71281E-10	6.20E-09
Proton	nist	1.007276467	938.2720813	938.2720813	938.2720767	1.0072765	4.620501E-06	4.98855E-09	6.2E-09
Neutron/electron	1838.683662		939.5654133	nist	939.5654127		5.6296233E-07		
Proton/electron	1836.152674		938.2720814	nist	938.2720767		4.6785007E-06		

Alternate method of calculating the gravitational constant

The proton model is based on one proton and measurement for G can only be performed for large masses. The field energy values for one proton appear in the proton model but they are small scale values. The reasoning led to what I call the cellular model of cosmology.

A model with no preferred position places the mass on the surface of a sphere. But it doesn't have to be a large sphere. It can be many small identical spheres that have the same surface area. The author

developed a concept called cellular cosmology that defines space as N=exp(180) spherical “cells” each with a proton. Collectively they represent large scale orbits.

Gravitational relationships define geodesics that are surfaces where particles orbit. Equating a large surface area with many small surface areas yields the following relationships:

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 and lower case r, v and m for cellular space) that determine the geodesic (the curved surface where an orbiting body feels no force). G large space= G cellular space with mass substitution M=m*exp(180) and surface area substitution R=r*exp(90).

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)**

GRAVITY			
			neutron
Neutron Mass (mev)			**939.5654**
Proton Mass M (kg)			**1.675E-27**
Field Energy E (mev)			**2.801**
Kinetic Energy/neutron ke (mev)			**10.151**
Gamma (g)=939.56/(939.56+ke)			**1.0000**
Velocity Ratio v/C=(1-g^2)^0.5			**0.0000**
Velocity (meters/sec)			**4.407E+07**
R (meters) =(HC/(2pI)/(E*E)^0.5			**7.045E-14**
Inertial Force (f)=(m/g*V^2/R)*1/EXP(90) Nt			**3.784E-38**
Calculation of gravitational constant G			6.693E-11
G=F*R^2/(M/g)^2=NT m^2/kg^2			**6.69292E-11**
Published by Partical Data Group (PDG)			**6.6741E-11**
R (meters) =(HC/(2pi)/(E*E)^0.5=1.97e-13/2.801			**7.045E-14**

In three dimensions the relationships give G for the surface of a sphere (or the equivalent area of many small spheres). If not it violates the "no preferred position" principle.

Proof that kinetic energy value 10.15 MeV is correct

The proton model underlies the atomic binding energy curve, specifically the strong residual kinetic energy 10.15 MeV that changes as atoms fuse. This led to work on the binding energy curve.

Barbee, Gene H., *A Simple Model of Atomic Binding Energy*, http://www.vixra.org/pdf/1307.0102.pdf , revised Feb 2014. Reference spreadsheet atom.xls.

Binding energy release/proton & neutron=10.15*exp(-2/number of protons)+ 10.15*exp(-2/number of neutrons). Electrostatic repulsion causes the atom to retain some energy and there were two smaller affects.

				(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				

NIST binding energy data was matched within average=0.0012 MeV.

The above work strongly supports the value 10.15 MeV as the residual strong energy. The binding energy model was a simple probability model following the same form as the proton model: