New Atomic Model from the Spectra of Hydrogen, Helium, Beryllium, Boron, Carbon, and Deuterium and Their Ions

Author Details: Janeen A. Hunt [1]*
[1] Affiliations: APS, American Physical Society-*Correspondence: voyajer17@hotmail.com; Tel: +1-949-643-8070
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Abstract: *A cohesive unifying theory of the atom does not currently exist in Quantum Physics. In this research, the atomic spectra are allowed to determine the model for the atom based upon the finding of patterns of the Balmer-Rydberg formula in the first 20 ions and neutral atoms of the periodic table. From this data, the model postulates a standing wave of varying energy antinodes originating from the particles in the nucleus of each atom which is able to predict the ionization energies of these atoms. The transitions of the electrons in atoms are defined by the energies of each antinode represented by the difference in energy between each spectral line. The spectral patterns for H, He-I, He-II, Li-I, Li-II, Li-III, Be-I, Be-II, Be-III, Be-IV, B-I, B-II, B-III, B-IV, B-V, C-I, C-II, C-III, C-IV, and Deuterium are charted and the ionization energies are calculated from the data including general inferences this model predicts about the unification of atomic forces, electron transitions, heat, and electromagnetism. This model predicts that the nucleus of every atom is held together by energy in the form of a standing wave originating from the nucleus and surrounding it. This is the Sollism Theory of the atom*
Keywords: *Atom, Atomic Model, Spectral Analysis, Quantum Mechanics, Atomic Theory, Unified Theory, Electron Transitions, Nuclear Force, Strong Force, Ionization Energy, Sollism Theory.*

1. Introduction

Quantum Mechanics is a set of rules governing the atom and the subatomic particles. Neither single formula nor single rule describes a single atom with its electrons and nuclear forces. A study of the history of Quantum Mechanics shows that ad hoc observations were ascribed ad hoc rules such as the Pauli Exclusion Principle and the Uncertainty Principle. Although this set of rules and abstruse formulae based on observation hold up well in the real experimental world, they do not form a cohesive atomic model nor do they relate well to general relativity. The method used to construct this new model is to use the most observable and non-controversial property of the atomic elements, that is, the atomic spectrum to form a model of a single atom that is comprehensive and takes into account both the electron paths and the nuclear forces and can be deduced directly from the spectra of elements in a way that unites all the atomic forces and explains phenomena that remains unexplained by QM and also predicts the ionization of the elements solely by their spectral data.

Let us assume that causality and invariance rule in the macro and micro worlds. We can infer from this that a permeable, massless, neutrally charged barrier exists to overcome the Coulomb force of the proton and electron in the Hydrogen atom. This model unites the phenomena that an alpha particle with a kinetic energy of about 5 MeV may pass through the atom as in the Rutherford Gold Foil experiment[1], and yet an electron of 20 to 200 eV may not pass through the atom as in Low Energy Electron Diffraction (LEED) experiments including the Davisson-Germer experiment[2]. Max Planck discovered in 1900 (elaborated by Einstein in 1905) that E=nhv where v is frequency and n is a whole number[3]. We can infer that there exists on the surface of every body of mass unradiated partial quanta as there is some energy that is not a whole number. To describe a partial quantum, the wavelength is less than a full quantum of energy necessary to radiate. Therefore, non-radiating massless, neutrally charged energy exists between the proton and the electron in the Hydrogen atom. This same energy separates each shell of the electron and exists in the form of a partial quanta standing wave. The electrons in atoms reside in the zero energy nodes of the proton standing wave. Let's examine the anomalies of the current theory and see how this assumption aids our understanding of the atom in decoding first the spectra of Hydrogen, Helium, and Lithium, and how this assumption causes us to arrive from theory to the known ionization energies. Then we will continue with the elements up to Carbon.

From the atomic spectra, we infer that all particles are held together by a standing partial-quanta wave of energy. Protons have an energy wave that is proportional to the Rydberg constant for the known transition series. The series of the spectral lines of Neutral Hydrogen are caused by different states of energy of the electron-particle with its standing wave, therefore, the Lyman, Balmer, Paschen, Brackett, Pfund, and Humphries series, etc., are electron transitions in Hydrogen atoms that have different energy states, meaning different amounts of energy stored in the partial quanta standing wave of the electron. The pattern for transitions was generally represented by Niels Bohr[4], but he did not analyze what the energy between transitions represented. Let us here take the difference in energy between spectral lines as literally energy between transitions.

We know that where n1 is Lyman ground state and n2 is an allowed transition line from Lyman ground state and E is energy, the spectrum tells us that if the distance of the transition between n1 and n2 is 1, then the energy for transition outward and inward is

$\boldsymbol{E_{n2} - E_{n1} = 1 \; and \; E_{n1} - E_{n2} = 1}$. If we calculate the Coulomb force between the electron and proton into the equation, we get an inequality because in one direction the electron is aided by the attractive force and in the other direction the electron must overcome the attractive force and the distance is different between shells:

$$E_{n2}\left(k_e\frac{q_1q_2}{r^2}\right) - E_{n1}\left(k_e\frac{q_1q_2}{(r-1)^2}\right) \neq E_{n1}\left(k_e\frac{q_1q_2}{r^2}\right) - E_{n2}\left(k_e\frac{q_1q_2}{(r+1)^2}\right)$$

Therefore, electromagnetism, i.e. the Coulomb force, is not determining the energy of the electron transition nor the direction of the electron transition. We will assume that a spherical standing wave of energy determines the difference in transition energy. The absorption line is the same energy as the emission line in the spectra. Electromagnetism guides the direction of the transition where possible, but the hypothesized proton-wave restricts the possible transitions. Let us examine how visualizing a proton-wave in the Neutral Hydrogen atom explains why an electron must be more excited to get to ground state of the Lyman Series. An anomaly in the current model is that ground state, or state of least energy, is the Lyman series and it is in the ultraviolet which would indicate a more excited state than other H series. Let us question how the inner Lyman series has higher frequency energy.

2. Results

We will go through the spectral series of each of the first 20 ions and neutral atoms of the first six elements in the periodic table showing how there exists a repeating pattern and how to calculate the expected ionization energy directly from the spectra of the ion.

2.1. Hydrogen

Let's examine the spectra for neutral Hydrogen. For visual convenience, the energies will be rounded in the column so marked[5].

Lyman Series Antinode Number	Larger Wavelength	Next Shorter Wavelength	Larger ʎ in eV	Next Shorter ʎ in eV	Transition Energy eV	Rounded Energy eV	Difference eV Between Series
101	121.566824	102.57222	10.1988704	12.0875251	1.8886547	1.89	
102	102.57222	97.25367	12.0875251	12.7485604	0.6610353	0.66	10.198
103	97.25367	94.9743	12.7485604	13.0545241	0.3059637	0.31	10.198
104	94.9743	93.78034	13.0545241	13.2207271	0.166203	0.17	10.198
105	93.78034	93.07482	13.2207271	13.3209421	0.100215	0.10	10.198
106	93.07482	92.62256	13.3209421	13.3859859	0.0650438	0.07	10.198
107	92.62256	92.3	13.3859859	13.433	0.0470141	0.05	10.198
108	92.3	92.1	13.433	13.462	0.029	0.03	
109	92.1	91.9	13.462	13.491	0.029	0.02	
110	91.9		13.491				

Balmer Antinode Number	Larger Wavelength	Next Smaller Wavelength	Larger ʎ in eV	Smaller ʎ in eV	Transition Energy eV	Rounded Energy eV	Difference eV Between Series
102	656.2711	486.1287	1.88922579	2.55044454	0.6612188	0.66	
103	486.1287	434.0462	2.55044454	2.85648	0.3060355	0.31	1.889
104	434.0462	410.174	2.85648	3.02272764	0.1662476	0.17	1.889
105	410.174	397.0072	3.02272764	3.12297683	0.1002492	0.10	1.889
106	397.0072	388.9049	3.12297683	3.18803977	0.0650629	0.07	1.889
107	388.9049	383.5384	3.18803977	3.23264708	0.0446073	0.04	1.889
108	383.5384		3.23264708			0.03	

Paschen Antinode Number	Larger Wavelength	Next Smaller Wavelength	Larger ʎ in eV	Smaller ʎ in eV	Transition Energy eV	Rounded Energy eV	Difference eV Between Series
103	1875.10481	1281.807	0.66121467	0.96726284	0.3060482	0.31	
104	1281.807	1093.81	0.96726284	1.13350974	0.1662469	0.17	0.661

105	1093.81	1004.94	1.13350974	1.23374956	0.1002398	0.10	0.661
106	1004.94	954.597	1.23374956	1.29881435	0.0650648	0.07	0.661
107	954.597	922.9	1.29881435	1.3434	0.0445856	0.04	0.661
108	922.9		1.3434			0.03	

Brackett	Larger	Next Smaller	Larger	Smaller	Transition	Rounded	Difference
Antinode Number	Wavelength	Wavelength	ʎ in eV	ʎ in eV	Energy eV	Energy eV	eV Between Series
104	4051.16	2625.15	0.30604673	0.47229464	0.1662479	0.17	
105	2625.15	2165.53	0.47229464	0.57253618	0.1002415	0.10	0.306
106	2165.53	1944	0.57253618	0.6378	0.0652638	0.07	0.306
107	1944	1817	0.6378	0.6824	0.0446	0.04	0.306
108	1817		0.6824			0.03	0.306

Pfund Series	Larger	Next Smaller	Larger	Smaller	Transition	Rounded	Difference
Antinode Number	Wavelength in nm	Wavelength in nm	ʎ in eV	ʎ in eV	Energy eV	Energy eV	eV Between Series
105	7460	4654	0.1662	0.2664	0.1002	0.10	
106	4654	3741	0.2664	0.3314	0.065	0.07	0.166
107	3741	3297	0.3314	0.3761	0.0447	0.04	0.166
108	3297	3039	0.3761	0.408	0.0319	0.03	0.166
109	3039		0.408			0.02	

Humphreys	Larger	Next Smaller	Larger	Smaller	Transition	Rounded	Difference
Antinode Number	Wavelength in nm	Wavelength in nm	ʎ in eV	ʎ in eV	Energy eV	Energy eV	eV Between Series
106	12370	7503	0.1002	0.1653	0.0651	0.07	
107	7503	5908	0.1653	0.2098	0.0445	0.04	
108	5908	5129	0.2098	0.2417	0.0319	0.03	
109	5129	4673	0.2417	0.2653	0.0236	0.02	
110	4673		0.2653		0.0190	0.02	

Table 1. Table of Antinodes of Hydrogen

Please note how each series repeats the energy differences between the spectral lines as is shown in blue. Note how each series starts with a spectral line (shaded) whose energy is equal to the energy difference of the first and second lines of the previous series. Now let's use our first assumption that the nodes of the proton standing wave are where the electrons reside. We see from the repeating differences between energies in each series shaded in blue that the energies represent the same antinodes being traversed by the electron through each series, but the electrons are in different states of excitation between the antinodes that have the same energies. See the chart below (Table 2) which shows this.

Hydrogen		Proton-wave Energy in eV	Nodes may contain electrons in energy states per spectrum in eV (rounded). Note: For Hydrogen, the ground state energy is zero excess energy in the electron-wave.					
Number			Lyman	Balmer	Paschen	Brackett	Pfund	Humphrey
99N	Node	0	Ground					
100A	Antinode	10.20						
100N	Node	0	10.20	Ground				
101A	Antinode	1.89						
101N	Node	0	12.09	1.89	Ground			
102A	Antinode	0.66						
102N	Node	0	12.75	2.55	0.66	Ground		
103A	Antinode	0.31						
103N	Node	0	13.06	2.86	0.97	0.31	Ground	
104A	Antinode	0.17						
104N	Node	0	13.22	3.02	1.13	0.47	0.17	Ground
105A	Antinode	0.10						
105N	Node	0	13.32	3.12	1.23	0.57	3.27	0.1002
106A	Antinode	0.07						
106N	Node	0	13.39	3.19	1.30	0.63	0.33	0.1653
107A	Antinode	0.04						
107N	Node	0	13.43	3.23	1.34	0.68	0.38	0.2098
108A	Antinode	0.03						
108N	Node	0	13.46	3.26	1.37	0.98	0.41	0.2417

Table 2. Table showing excitation of electrons in Hydrogen

(Note: Since every particle is assumed to be surrounded by a standing wave of energy originating from the particle, the electron and the proton will be referred to as the electron-wave and the proton-wave.) We see from the spectrum of Hydrogen in the charts that each series, representing the excitation state of the electron-wave in Hydrogen, shows that the proton-wave maintains its antinode energy levels no matter what excitation state that the electron-wave is in. The antinode energy levels repeat with every series. Niels Bohr only allowed transitions per series as transitions from ground state and to ground state. However, intermediate transitions can be accomplished that would create allowable spectral lines. Therefore, an electron in the Lyman series will start to absorb light that is more and more infrared as its energy increases incrementally. Conversely, an electron slowly losing energy in the Lyman Series will be emitting infrared light as it goes to Lyman ground state. In fact, a graph of light wavelengths from the transitions of an electron would look like Planck's Radiation Law Spectral Graph due to the preponderance of infrared light emitted by incremental transitions.

To make this clear: An increase from Lyman ground state through the first 10.20 eV antinode is an increase in energy by 10.20 eV. An incremental increase from 10.20 eV to 12.09 eV produces an absorption of 1.89 eV. An incremental increase from 12.09 eV to 12.75 eV produces an absorption of .66 eV. As the electron transitions through the higher Lyman series, it is absorbing incremental energy changes. As a high-energy electron cools, it may be a Lyman electron and yet emit no Lyman lines unless the drop in temperature is large enough, but the cooling Lyman electron may emit spectral radiation of the lines associated with the lower energy series if the electron emits radiation slowly. The effect of the proton-wave antinodes causes most emission and absorption to occur in the infrared even if the electron is traveling through the higher Lyman energy series.

The spectrum in the tables agrees with what we already know, but by allowing the energy differences between lines to describe energy, a whole new picture of the atom emerges. For energy to be described at atomic scales, the energy must be contained in a wavelength that is of atomic proportions. Thus, we introduce Planck's partial quantum that does not radiate.

Taking the case of the Lyman Series excitation state of Hydrogen, the energy in the partial quantum antinode between ground state for the electron and the next node is 10.20 eV. To overcome this antinode and move from Lyman ground state, the electron must gain 10.20 eV of energy. The next energy difference is described by an antinode of 1.89 eV of energy which antinode is also seen in the Balmer series. The next energy difference is described by an antinode of 0.66 eV of energy which antinode is also seen in the Balmer and Paschen series. The next antinode in the Lyman series contains 0 .31 eV of energy. This antinode is also seen in the Balmer, Paschen, and Brackett series. For all series, the partial quanta in the proton standing wave continues outward per this pattern, and we will examine how the energy of the antinodes continues inward toward the proton in a wave pattern. The electrons reach their ionization energy before they can transition inward through the higher energy antinodes of the proton-wave toward the nucleus.

The proton particle is emanating the standing wave in which the electron particle with its associated wave is transitioning. For each different excitation state of the electron-wave in the Hydrogen atom described by each series, the energy of the electron changes, but the proportion of the antinodes is always according to that described by the energy differences between the lines described by the Balmer-Rydberg formula. The spectra of Hydrogen defines the (rounded) antinodes as infinity to ... , 0.03 eV, 0.04 eV, 0.07 eV, 0.10 eV, 0.17 eV, 0.31 eV, 0.66 eV, 1.89 eV, and 10.20 eV.

Because we describe radiated light as a full quantum proportional to its wavelength, knowing the relative size of the atom, we can see that the partial quanta in the antinodes describes a wavelength for each related energy that is a small fraction of a full radiated quantum. Let us consider the wavelength which these antinodes maintain. Where a radiated energy of 0.6612eV would produce a wavelength of 1875 nm, an antinode of 0.6612 eV in a partial quanta wave must have a wavelength that is a fraction of the 0.11 nm size of the hydrogen atom[6]. This relation between wavelength sizes in a partial quantum wave must be proportional in the same way that radiated light has a wavelength that is proportional to the energy of the light. So the larger the energy contained in the antinode, the smaller the wavelength of the antinode. So a partial quantum is described by **e=hc/jʎ** where **e** is energy and **j** is a constant that is a fraction of wavelength, **h** is Planck's constant, and **ʎ** is the wavelength of the partial quantum. A non-rigorous maximum preliminary estimate of j would be .0000267 of **ʎ** of radiated light although the spectrum leads us to believe the number is less than that.

Protons have an energy wave that is defined by the difference in the energy between the spectral lines. The series in the spectra are caused by different states of energy of the electron with its electron-wave in the Hydrogen atom as it transitions through the antinodes of the proton-wave. The energy of the electron describes the energy of the radiated light it produces. The Lyman Series is in the ultraviolet because the electrons must be in an energy state that will overcome the 10.20 eV antinode to transition inward closer to the nucleus.

2.1.1. Description of the Proton-Wave

The electron-wave stores excess energy equal to the energy required to maintain its position in the node of the Series that it describes, but the proton-wave antinodes maintain a consistent antinode energy in the spectra. Therefore, the electron-wave loses and gains the amount of energy in transitions equal to the antinode it passes through while the proton-wave remains a stable energy. The spectrum tells us that each series can be described by a difference in the total overall energy of the electron as it passes through the same energy antinodes. As we know when the electron is in a higher energy state, the electron is oscillating faster according to the frequency associated with the energy. So, a Lyman series electron will be vibrating more rapidly in a node than a Balmer series electron in the same node. The ground state for each series is a different node. Only higher energy electrons can penetrate further towards the nucleus. A Paschen electron of 0.66 eV, a Balmer electron of 2.55 eV, and a Lyman electron of 12.75 eV, may occupy the same node according to the spectrum for Hydrogen.

Each series has a ground state because the antinode of the next series holds the electron in place until it gains enough energy to pass through an inner antinode. This is in accord with Einstein's original findings on specific heat, as well as Debye's findings, and those of current QM theory i.e. that in solids the temperature increases in jumps of energy. [7,8] It is easy to see why the electrons do not normally transition into the nucleus as the energy gets higher with each antinode as the antinodes approach the nucleus. The proton-wave is the force that dominates the atom, and the electromagnetic force determines the probable direction of movement.

The following are data and charts of the Hydrogen proton-wave in Table 3, Chart 1 and 2.

Per antinode	Energy eV	
10	0.02360	Outer wave
9	0.03190	
8	0.04460	
7	0.06500	
6	0.10020	
5	0.16620	
4	0.30610	
3	0.66122	
2	1.88923	
1	10.19800	Inner wave

Table 3. Data for graph of Proton Wave

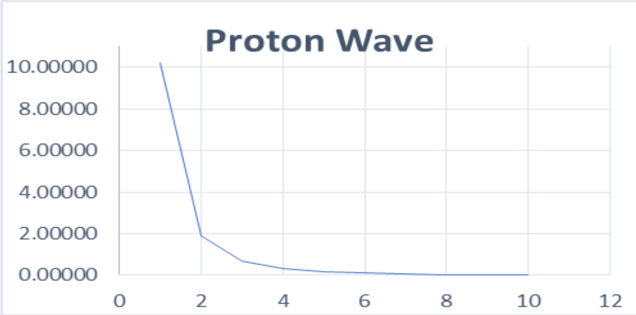

Chart 1. Graph of proton wave

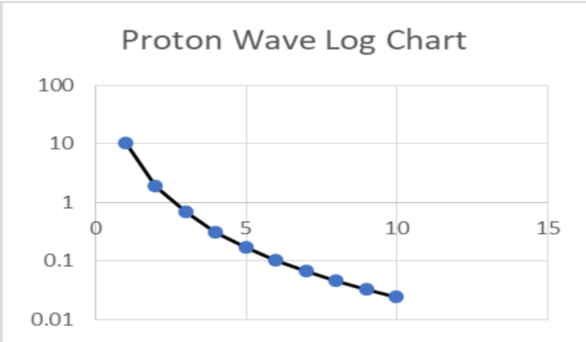

Chart 2. Graph of proton wave as a Log Chart

Spectral series energy levels between lines are shown in the chart. We can see that if the energy of the next antinode followed this curve that the next antinode would be much higher than 10.20 eV as the energy begins to increase exponentially to the nucleus. This would prevent the electrons from transitioning closer to the nucleus as an increase in energy would ionize the electron. Also, we can see why being in ground state of one series, the electron must be more excited to get into the higher energy ground state of an inner series of antinodes in the proton-wave toward the nucleus. The electrons normally transition through the antinodes that are less than or equal to 10.20 eV in Neutral Hydrogen.

Antinodes in eV	
10.19800	
1.88923	
0.66122	
0.30610	
0.16620	
0.10020	
0.06500	
0.04460	
0.03190	
0.02360	
0.01900	
0.01420	
0.00970	
13.52895	**Subtotal**
etc.	
≈**13.59843**	**Rydberg Energy**[9]

Table 4. Table showing energy of antinodes calculating with a limit of infinity converges to the total for the Rydberg Energy

The Balmer equation which found the actual sequence between the lines was later transformed into the Balmer-Rydberg formula. It describes outer wave series beginning with the Lyman series, but does not describe the sequence extended to higher inner antinode energies as light is not abundantly radiated from inner nodes. We can see that the ionization energy described by the Rydberg energy is equal to the sum of all the antinodes from the Lyman series ground state to the limit described by the Balmer-Rydberg formula. Originally Rydberg wrote his equation as wavelengths divided by Rydberg constant. The Rydberg constant describes the energy of the wavelengths. The wavelengths divided by the entire energy of all the antinodes is then staggered per the Rydberg pattern formula which is the basis for the universal inverse square law. 13.6/n2. The inverse square law means that energy is spreading spherically over space. As the energy spreads over consecutive spheres, the energy is divided by the square of equal changes in the radius. It is the energy difference between the consecutive spheres that is shown to be the antinodes of the proton-wave. For every whole number n where Ry is Rydberg Energy, take the difference between each value obtained to arrive at the antinode energy for $\frac{Ry_{\infty}}{n^2}$ as shown in Table 5.

Sphere #	Total eV Ry	n^2	Ry/n^2	Difference
1	13.59840	1	13.5984	0.00000
2	13.59840	4	3.3996	10.19880
3	13.59840	9	1.510933333	1.88867
4	13.59840	16	0.8499	0.66103
5	13.59840	25	0.543936	0.30596
6	13.59840	36	0.377733333	0.16620
7	13.59840	49	0.277518367	0.10021
8	13.59840	64	0.212475	0.06504
9	13.59840	81	0.167881481	0.04459

Table 5. Sum of all energy differences converges to Rydberg constant

We know the Rydberg energy limit is theoretically calculated as 13.59843…. eV[10] and this continues to infinity under the inverse square law. Therefore, for each proton in the universe, the approximately 13.6 eV of energy is spreading out across the universe to infinity. The first 13 antinodes account for 13.52895 eV of this energy which is concentrated in or near the atom forming matter.

However, we cannot consider Lyman ground state as a point in space where energy arbitrarily begins in the Neutral Hydrogen atom, because the center of the atom does not begin at Lyman ground state. Rather the Rydberg energy antinodes begin their inverse square dispersion from a point which may be considered as the surface of a sphere of energy in space around the nucleus from which energy has bled out. So far, we have established that in Hydrogen, at the surface of an energy sphere in space where the nucleus is the center of the sphere, the Rydberg Energy has bled out from Lyman ground state into the surrounding volume of space according to the inverse square law. However, this energy does not radiate away as it is partial quantum energy. It therefore forms a standing wave of partial quanta energy through which the electrons transition.

Having established the groundwork that energy exists between the electron transitions from Lyman ground state outward from the nucleus, we can then assume that energy exists between Lyman ground state and the nucleus. Because this energy does not radiate, it is also partial quantum energy. However, this energy has not propagated out from the nucleus in a manner conforming to the inverse square law.

Assuming **$e=mc^2$** describes a relation between the proportion of mass and energy in a particle[11] and assuming further that for subatomic particles the mass is created by the energy surrounding it, we can estimate the inner antinodes of the standing proton-wave by retrofitting the data along the same curve from the nucleus to the known energy levels as in the data shown in Table 6 and Chart 3.

	Per cycle	Energy eV
Outer	15	.024
Antinode	14	.032
	13	.045
	12	.065
	11	.100
	10	.166
	9	.306
	8	.661
Inner	7	1.889
Antinode	6	10.198
Estimated	5	84.820
Estimated	4	1473.000
Estimated	3	59510.000
Estimated	2	5361000.000
Estimated	1	932850000.000
	Total energy	938272081.306
Energy of proton-wave: 938,272,081 eV		

Table 8. Estimate of entire proton wave energy through extending known curve

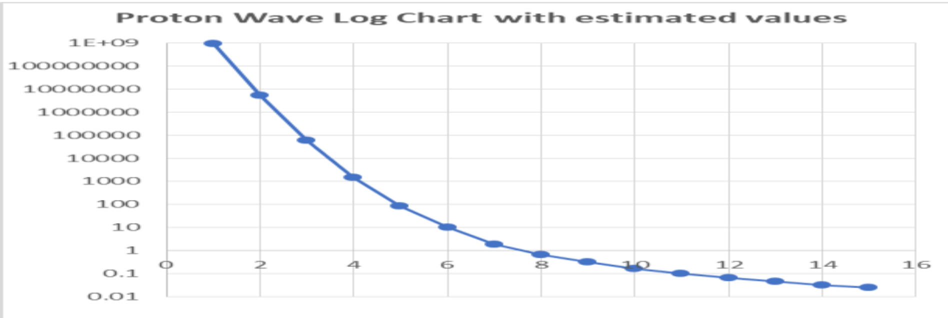

Chart 3. Log Chart of proton wave with estimated extension of Balmer-Rydberg curve

This would change the Bohr radius to much closer to the nucleus. This would indicate that most of the energy in the atom is right up against the nucleus. This steep inward curve of energy from the outer proton-wave to the proton-particle appears to follow the rules of special relativity. The inward curve changes from Isaac Newton to Einstein. No pattern in the relativistic change factor is readily apparent. The universe is very precise so these numbers must have a relation to one another. The graph shown in Chart 3 is an exponential decay curve from the nucleus and probably can be depicted mathematically by a negative e (Euler's number) exponential formula. Table 7 shows the estimated change factor.

Relativistic Change Factor	Inner Antinodes	% of c
8.317355249	84.820	0.992746
17.36611925	1473.001	0.998340700018
40.4006106	59510.139	0.99969361981
90.08548254	5360999.615	0.9999383868
174.0067302	932850013.784	0.99998348641
	938272081.359	

Table 7. Estimate of change in antinode energies as a percent of the speed of light

If we assume that the proton is spherical, beginning with the radius of the sphere of the proton particle, each antinode represents an increase in spherical energy which represents an increase in the radius of the proton—a proton being defined as including its proton-particle and its associated proton-wave.

2.1.2. Quantum Mechanical Effects Explained from Above Assumption of Sollism Theory

The objections to a new theory of the atom can be raised upon the grounds of the proofs of Quantum Mechanics in the form of quantum tunneling, quantum entanglement, the Uncertainty Principle, and the Pauli Exclusion Principle. Wave-Particle Duality is obviously explained in this new theory as the particle is a wave and a particle at the same time i.e. a particle surrounded by a wave. Because no new theory should be accepted unless it can encompass the phenomena of QM, they will be briefly addressed. In this model of the atom, tunneling is accounted for because the nucleon-waves create an atomic-wave that extends far beyond the particles that create matter. In current QM Theory, the Uncertainty Principle predicts phenomena such as the Casimir Effect. We can see this is the effect of the energy of the proton-waves resisting each other. Under this new theory, the Pauli Exclusion Principle is due to the resistance of the energy of particle-waves. Vacuum or Zero Point Energy is the energy of the proton-wave that fills space as can be deduced from the Balmer-Rydberg formula extending the energy of each single proton to infinity. In fact, the "vacuum catastrophe" shows that the Uncertainty Principle is inaccurate and need not be regarded as it is unnecessary and appears to give incorrect values[12]. We know that many atomic observation devices input energy into the system, so that, inputting energy into a system changes its measurement. This is not a proof of the Uncertainty Principle. When we measure by absorption, we get exact measurements. Also, we can correct for the amount of energy we input into a system when observing the system. Therefore, the Uncertainty Principle is unnecessary and should be disregarded as it makes predictions like the Vacuum Catastrophe. In this model, any predictions made by the Uncertainty Principle can be attributed to the force of the proton-wave extending beyond the atom and extending into the nucleus of the atom. Since the universe is filled with proton-waves, there is, in fact, no true vacuum. In order to account for Quantum Entanglement which has been tested on photons, there needs to be a more precise theory for both light and the photon which will be attempted here and which seems to come naturally as a consequence of Sollism Theory.

So instead of many rules governing the atom, the amount of resistance of every point in space can theoretically be calculated as the amount of resistance caused by the energy being exerted by all the particle-waves in that space. The amount of pressure of every point in space can theoretically be calculated as the amount of pressure exerted on every particle by its particle-wave and by the energy-waves of every other particle in space. The proton-waves extending to infinity cause energy to surround all matter in great spheres where the nearer particles are to each other, the greater the energy surrounding them. Every particle is interior to wave-energy that exerts pressure and exterior to wave energy from other particles that exerts resistance.

We will see how theorizing energy between the spectral lines helps us decipher the spectra of the elements and gives us the ionization values directly from the spectra.

2.2. Helium

For two protons to fuse into Helium, or more precisely four nucleons to fuse into Helium, the nucleons must overcome their respective wave energies and become trapped in each other's particle-waves. We can see that by assuming causality for the separation of the electrons from the nucleus, we explain the Strong Force.In Helium, there would be two protons, each with associated proton-waves, and two neutrons, each with associated neutron-waves. The neutron-waves have insufficient energy to create a stable particle. It is only by being enclosed in a proton-wave that the neutron-particle becomes stable. We know from Deuterium, shown later in this article, that the neutron-wave does contribute to the nucleon-wave energy, but as the contribution of energy is negligibly small, we will neglect the contribution of the neutron-wave in our evaluation of the proton-waves in the following elements. In Helium II we see that the two proton-waves are in superposition and being emitted from the nucleus. The waves are coherent and in phase. The energy is not linear superposition, but spherical superposition and the energy values are squared from Neutral Hydrogen to Helium II. The pattern of the antinodes of the proton-wave of Hydrogen repeats with four-fold energy in Helium II showing complete constructive interference as shown in Table 8 below[13].

He-II Series 1 [14]	Larger	Next Shorter	Larger	Next Shorter	Transition	Rounded	Difference
Antinode	Wavelength	Wavelength	ʎ in eV	ʎ in eV	Energy eV	Energy eV	eV Between Series
He II	30.37858	25.63177	40.8131087	48.3713879	7.5582792	7.558	
He II	25.63177	24.30266	48.3713879	51.0168141	2.6454262	2.645	40.81
He II	24.30266	23.73307	51.0168141	52.2412098	1.2243957	1.224	40.81
He II	23.73307	23.43472	52.2412098	52.9062984	0.6650886	0.665	40.81
He II	23.43472	23.25842	52.9062984	53.3073308	0.4010324	0.401	40.81
He II	23.25842	23.14541	53.3073308	53.5676097	0.2602789	0.260	40.81

He II	23.14541		53.5676097				

He-II Series 2 Antinode	Larger Wavelength	Next Shorter Wavelength	Larger ʎ in eV	Next Shorter ʎ in eV	Transition Energy eV	Rounded Energy eV	Difference eV Between Series
He II	164.0375	121.509	7.55829788	10.2037239	2.64542602	2.65	
He II	164.04897		7.55776942				Fine structure
He II	121.509	108.494	10.2037239	11.4277682	1.2240443	1.22	7.55
He II	108.494	102.527	111.4277682	12.0928564	0.6650882	0.67	7.56
He II	102.527	99.236	12.0928564	12.4938962	0.4010398	0.40	7.56
He II	99.236	97.211	12.4938962	12.7541563	0.2602601	0.26	7.56
He II	97.211	95.87	12.7541563	12.9325575	0.1784012	0.18	7.56
He II	95.87		12.9325575				

He-II Series 3 Antinode	Larger Wavelength	Next Shorter Wavelength	Larger ʎ in eV	Next Shorter ʎ in eV	Transition Energy eV	Rounded Energy eV	Difference eV Between Series
Calculated	468.7	320.31	2.645	3.870764	1.220764	1.22	
He II	320.31	273.33	3.8707636	4.53607101	0.66530741	0.665	2.65
He II	273.33	251.12	4.53607101	4.93725824	0.40118723	0.401	
He II	251.12	238.54	4.93725824	5.19763682	0.26037858	0.260	
He II	238.54		5.19763682			0.180	

He-II Series 4 Antinode	Larger Wavelength	Next Shorter Wavelength	Larger ʎ in eV	Next Shorter ʎ in eV	Transition Energy eV	Rounded Energy eV	Difference eV Between Series
Calculated	1012.9		1.22			0.665	
Calculated						0.401	

He-II Series 5 Antinode	Larger Wavelength	Next Shorter Wavelength	Larger ʎ in eV	Next Shorter ʎ in eV	Transition Energy eV	Rounded Energy eV	Difference eV Between Series
He II	1863.68	3090.85	0.66526672			0.401	

He-II Series 6 Antinode	Larger Wavelength	Next Shorter Wavelength	Larger ʎ in eV	Next Shorter ʎ in eV	Transition Energy eV	Rounded Energy eV	Difference eV Between Series
He II	3090.85		0.40113376	0.66526672	0.26413296		

Helium I

He I-1A Antinode	Larger Wavelength	Next Shorter Wavelength	Larger ʎ in eV	Next Shorter ʎ in eV	Transition Energy eV	Rounded Energy eV	Difference eV Between

He I	58.433436	53.702992	21.2180623	23.0870616	1.8689993	1.869	20.631349
He I	53.702992	52.221309	23.0870616	23.7421143	0.6550527	0.655	20.6151201
He I	52.221309	51.561684	23.7421143	24.0458455	0.3037312	0.304	20.6149288
He I	51.561684	51.209856	24.0458455	24.2110481	0.1652026	0.165	20.6148333
He I	51.209856	50.999829	24.2110481	24.3107538	0.0997057	0.100	20.6147844
He I	50.999829	50.864338	24.3107538	24.3755121	0.0647583	0.065	
He I	50.864338	50.771809	24.3755121	24.4199352	0.0444231	0.044	
He I	50.771809	50.705802	24.4199352	24.4517242	0.031789	0.032	
He I	50.705802	50.657057	24.4517242	24.475253	0.0235288	0.024	

He I-1B	Larger	Next Shorter	Larger	Next Shorter	Transition	Rounded	Difference
Antinode	Wavelength	Wavelength	ƛ in eV	ƛ in eV	Energy eV	Energy eV	eV Between
He I	2113.203	501.56783	0.58671329	2.47194151	1.8852282	1.885	
He I	501.56783	396.4729	2.47194151	3.12718546	0.655244	0.655	0.36179094
He I	396.4729	361.364	3.12718546	3.43101219	0.3038267	0.304	0.35440265
He I	361.364	344.759	3.43101219	3.59626373	0.1652515	0.165	0.34986754
He I	344.759	335.455	3.59626373	3.69600777	0.099744	0.100	0.35026411

He I-2A	Larger	Next Shorter	Larger	Next Shorter	Transition	Rounded	Difference
Antinode	Wavelength	Wavelength	ƛ in eV	ƛ in eV	Energy eV	Energy eV	eV Between
He I	587.562	447.148	2.11015057	2.77278281	0.6626322	0.663	0.25358208
He I	447.148	402.3973	2.77278281	3.08114465	0.3083618	0.308	0.25376225
He I	402.3973	381.9607	3.08114465	3.24599962	0.164855	0.165	0.25556565
He I	381.9607	370.5	3.24599962	3.34640833	0.1004087	0.100	
He I	370.5	363.423	3.34640833	3.41157353	0.0651652	0.065	1.9444857
He I	363.423	358.727	3.41157353	3.45623354	0.04466	0.0447	2.00026445

He I-2B	Larger	Next Shorter	Larger	Next Shorter	Transition	Rounded	Difference
Antinode	Wavelength	Wavelength	ƛ in eV	ƛ in eV	Energy eV	Energy eV	eV Between
He I	667.815	492.193	1.85656849	2.51902056	0.6624521	0.662	
He I	492.193	438.793	2.51902056	2.825579	0.3065584	0.307	1.85548204
He I	438.793	414.3761	2.825579	2.9920748	0.1664958	0.166	1.85579828

He I-3A	Larger	Next Shorter	Larger	Next Shorter	Transition	Rounded	Difference
Antinode	Wavelength	Wavelength	ƛ in eV	ƛ in eV	Energy eV	Energy eV	eV Between
He I	1868.534	1278.479	0.66353852	0.96978072	0.3062422	0.306	
He I	1278.479	1091.305	0.96978072	1.13611161	0.1663309	0.166	
He I	1091.305	1002.773	1.13611161	1.2364157	0.1003041	0.100	0.1002424
He I	1002.773	952.617	1.2364157	1.30151392	0.0650982	0.065	0.10072556
He I	952.617	921.034	1.30151392	1.34614388	0.04463	0.0446	

He I-3B	Larger	Next Shorter	Larger	Next Shorter	Transition	Rounded	Difference
Antinode	Wavelength	Wavelength	ƛ in eV	ƛ in eV	Energy eV	Energy eV	eV Between
He I	1196.912	1091.71	1.03586921	1.13569014	0.0998209	0.100	

He I	1091.71	1031.154	1.13569014	1.20238518	0.066695	0.0667	

He I-3C	Larger	Next Shorter	Larger	Next Shorter	Transition	Rounded	Difference
Antinode	Wavelength	Wavelength	ʎ in eV	ʎ in eV	Energy eV	Energy eV	eV Between
He I	1700.247	1196.912	0.72921421	1.03586921	0.306655	0.307	
He I	1196.912	1031.154	1.03586921	1.20238518	0.166516	0.167	0.06610366
He I	1031.154	951.66	1.20238518	1.30282274	0.1004376	0.100	0.06669504
He I	951.66	906.327	1.30282274	1.36798781	0.0651651	0.065	0.06682981

He I-3D	Larger	Next Shorter	Larger	Next Shorter	Transition	Rounded	Difference
Antinode	Wavelength	Wavelength	ʎ in eV	ʎ in eV	Energy eV	Energy eV	eV Between
He I	1869.723	1278.499	0.66311656	0.96976555	0.306649	0.307	
He I	1278.499	1091.71	0.96976555	1.13569014	0.1659246	0.166	
He I	1091.71	1003.116	1.13569014	1.23599293	0.1003028	0.100	
He I	1003.116	952.927	1.23599293	1.30109052	0.0650976	0.065	
He I	952.927	921.034	1.30109052	1.34614388	0.0450534	0.045	

Table 8. Table of the energies of the antinodes of neutral Helium

Next in Table 9 we see the proton-waves for Helium II with two proton waves in superposition and various ground states.

HELIUM II		Antinode eV	May contain electrons in energy states in eV (rounded)						
Number			Series H2-1	Series H2-2	Series H2-3	Series H2-4	Series H2-5	Series H2-6	Series H2-7
99N	Node	0	Ground						
100A	Antinode	40.81							
100N	Node	0	40.81	Ground					
101A	Antinode	7.56							
101N	Node	0	48.37	7.56	Ground				

102A	Antinode	2.65							
102N	Node	0	51.02	10.20	2.65	Ground			
103A	Antinode	1.22							
103N	Node	0	52.24	11.43	3.87	1.22	Ground		
104A	Antinode	0.67							
104N	Node	0	52.91	12.09	4.54	1.89	0.67	Ground	
105A	Antinode	0.40							
105N	Node	0	53.31	12.49	4.94	2.29	1.07	0.4	Ground
106A	Antinode	0.26							
106N	Node	0	53.57	12.75	5.20	2.55	1.33	0.66	0.26
107A	Antinode	0.18							
107N	Node	0	53.75	12.93	5.38	2.73	1.51	0.84	0.44

Table 9. Table showing excitation of electrons in Helium II

When we examine the proton-wave in Helium I, it gives us unexpected values which were not found by Niels Bohr nor any quantum theorist until now. In Helium II, the proton-waves are in phase, and the constructive interference causes the single electron to transition at a four-fold energy level relative to Neutral Hydrogen. In Helium I, the spectrum infers that although the proton-waves are still coherent, the proton-waves are arrayed as to allow independent transition for each electron so that the two electrons in Helium I transition each on their own proton-wave. Therefore, the very same antinode energies of the proton-waves in Helium I equal those of Neutral Hydrogen. The addition of an electron in Helium I polarizes one proton-wave to one electron rather than the polarization of two proton-waves to one electron in Helium II. In Helium I, the transition energy changes because the ground state rather than being zero energy changes to a higher energy level. The mathematical relation or equation that creates the new ground state energy causing the increase in transition energy is unclear, but we can derive the ionization energy from the non-zero ground state energy.

Note the repeating pattern shown in blue of the antinodes in the spectrum of Helium I showing that they are on average equal to the antinodes of Neutral Hydrogen. It should also be noted that for each series, the two electrons in Helium I are paired for each energy level as we shall see from the spectrum. The pattern found in Table 10 below is completely novel in the history of science.

Table 10. Table of Helium I

A comparison of Hydrogen and Helium antinodes is shown below in Table 11.

Hydrogen	Helium I	Ratio
10.20		N/A
1.89	1.87	1.0
0.66	0.66	1.0
0.306	0.304	1.0
0.166	0.165	1.0
0.100	0.100	1.0
0.065	0.065	1.0
0.044	0.044	1.0
0.032	0.032	1.0

Hydrogen	Helium II	Ratio
10.198	40.81	4.0
1.889	7.558	4.0
0.665	2.645	4.0
0.306	1.224	4.0
0.166	0.665	4.0
0.100	0.401	4.0
0.065	0.260	4.0
0.044	0.178	4.0
0.032		

Table 11. Comparison of Hydrogen and Helium I and a comparison of Hydrogen and Helium II.

Helium I antinodes are grouped below in Table 12. To arrive at the ground state energy, subtract the energy of the line above ground state from the antinode between ground state. I have shown the proton-wave energies as equal to Hydrogen for convenience. The variation from Hydrogen proton-waves to Helium proton-waves is small. And that variation is due to the distortion of the proton-waves by the increase in the size of the nucleus which decreases the overall energy and with an additional small increase in energy by the wave energy of the neutrons. In other words, the small differences in the energy of the antinodes of the Helium I atom's proton-waves when compared to the Neutral Hydrogen atom are due to the larger radius of the nucleus causing the great sphere of energy in the first antinode around the nucleus to change the energy levels of the entire proton-wave. Also, the cumulative effect of the neutron-waves is affecting the energy of the nuclear antinodes. But the proton-wave of Hydrogen according to the difference in energy between the lines in the Balmer-Rydberg equation is still clearly seen as the ratio is clearly 1:1 shown in Table 11.

Helium I		Energy in eV	May contain electrons in energy states in eV (rounded) Note: For Helium I, the ground state energy is 11.02 eV excess energy in electron-wave.							
Number			He I-1	He I-1	He I-2	He I-2	He I-3	He I-3	He I-3	He I-3
99A	Antinode	≈ 85 eV								
99N	Node	0	11.02							
100A	Antinode	10.20								
100N	Node	0	21.22	0.58	0.22					
101A	Antinode	1.89								
101N	Node	0	23.09	2.47	2.11	1.86	Ground	0.07		
102A	Antinode	0.66								
102N	Node	0	23.74	3.13	2.77	2.52	0.66	0.73		
103A	Antinode	0.31								
103N	Node	0	24.05	3.43	3.08	2.83	0.97	1.04	0.87	0.97
104A	Antinode	0.17								
104N	Node	0	24.21	3.59	3.246		1.14	1.20	1.04	1.14
105A	Antinode	0.10								
105N	Node	0	24.31		3.346		1.24	1.30	1.14	1.24
106A	Antinode	0.07								
106N	Node	0	24.38		3.412		1.30	1.37		1.30

Table 12. Table showing excitation of electrons in Helium I

The ability to calculate ionization energy directly from data without experimentation in atoms with more than one electron has until now not been possible. However, in this model, the ionization energy is seen by examining the electron in its ground state of the highest energy series for most atoms of an element. The ground state electron in Helium I holds an excess partial quantum of energy. We can analyze the electron energies from Helium II to Helium I and see how the electrons are paired in the Table 13 below.

Nullius in verba, but the word of the stars.

	He II Energy in eV	He I Energy in eV		**He I**	**He I**				**He I**	**He I**					**He I**		
	He II	**He I**	Series He II-1	He I-1	He I-2	Sub-total He I-1	%of He II	Series He II-1	He I-1	He I-2	Sub-total He I-2	%of He II	Series He II-3	He I-3	He I-3	Sub-total He I-3	%of He II
Anti-n	≈ 340	≈ 85															
Node	0	0	Ground	11.02													
Anti-n	40.81	10.20															
Node	0	0	40.81	21.22	0.58	21.79	0.53	Ground	0.22								

Anti-n	7.56	1.89															
Node	0	0	48.37	23.09	2.47	25.55	0.53	7.56	2.11	1.86	3.97	0.52	Ground	0.07	Ground		
Anti-n	2.65	0.66															
Node	0	0	51.02	23.74	3.13	26.87	0.53	10.20	2.77	2.52	5.29	0.52	2.65	0.73	0.66	1.38	0.52
Anti-n	1.22	0.31															
Node	0	0	52.24	24.05	3.43	27.48	0.53	11.43	3.08	2.83	5.91	0.52	3.87	1.04	0.97	2.00	0.52
Anti-n	0.67	0.17															
Node	0	0	52.91	24.21	3.59	27.80	0.53	12.09	3.25	3.00	6.24	0.52	4.54	1.20	1.14	2.34	0.52
Anti-n	0.40	0.10															
Node	0	0	53.31	24.31	3.70	28.01	0.53	12.49	3.35	3.10	6.44	0.52	4.94	1.30	1.24	2.54	0.51
Anti-n	0.26	0.07															
Node	0	0	53.57	24.38	3.77			12.75	3.41	3.17	6.58	0.516	5.20	1.30	1.30	2.60	0.50

Table 13. Table pairing the electrons in Helium I and showing the ground states.

Because the same antinodes appear in Helium I as in Neutral Hydrogen, the ionization energy should be the same as Neutral Hydrogen except that Helium I has a ground state that is not equal to zero, but 11.02 eV. Therefore, the 11.02 eV must be added to the Rydberg energy of Neutral Hydrogen to arrive at the ionization energy of Helium I as shown in Table 14 below which calculates the ionization energy directly from the spectra:

	Hydrogen Antinodes in eV	Helium II Antinodes in eV	
	10.1980	40.7920	
	1.8892	7.5569	
	0.6612	2.6449	
	0.3061	1.2244	
	0.1662	0.6648	
	0.1002	0.4008	
	0.0650	0.2600	
	0.0446	0.1784	
	0.0319	0.1276	
	0.0236	0.0944	
	0.0190	0.0760	
	0.0142	0.0568	
	0.0097	0.0388	
	13.5290	54.1158	**Subtotal**
	etc.	etc.	**Add all antinodes**
NIST	≈13.5984	≈54.3936	**H*4=Rydberg Energy**
NIST	≈13.6057	≈54.4227	**H*4=Rydberg Energy**
		54.4177	**NIST ionization**

Helium I Antinodes in eV	
10.1980	
1.8892	
0.6612	
0.3061	
0.1662	
0.1002	
0.0650	
0.0446	
0.0319	
0.0236	
0.0190	
0.0142	
13.5193	**Subtotal**
etc.	**Add all antinodes**
≈13.59	**Rydberg Energy**
+ 11.02	**Ground State energy**
≈24.61	**Calculated Ionization Energy**
24.5874	**NIST ionization**

Table 14. Table showing Helium II and Helium I ionization calculation from collected spectral data.

As we have seen previously, when Helium I loses its electron, the proton-waves polarize toward one electron and change formation to the state of Helium II and, therefore, the proton-waves arrange themselves in spherical superposition and the energy for ionization changes to that of Helium II.

We can infer that the chemical properties of elements are not only dependent on the number of protons, but are dependent upon the structural pattern that the proton-waves take in the atom.

2.3. Lithium

As we know from current theory, Lithium III follows the one electron polarization pattern of Helium II. In Lithium III, the three proton-waves are in spherical superposition paired to one electron and the overall energy is nine times that of Neutral Hydrogen. [15] Table 15 below shows the series for Lithium III.

L3-1 Series	Larger	Next Shorter	Larger	Next Shorter	Transition	Rounded	Difference
Antinode Number	Wavelength	Wavelength	ʎ in eV	ʎ in eV	Energy eV	Energy eV	eV Between Series
Li III	13.5	11.39	91.8403177	108.853756	17.013438	17.013	
Li III	11.39	10.8	108.853756	114.800397	5.946641	5.947	91.85
Li III	10.8	10.55	114.800397	117.520785	2.720388	2.720	91.84
Li III	10.55	10.41	117.520785	119.101276	1.580491	1.580	91.85
Li III	10.41	10.34	119.101276	119.907571	0.806295	0.806	
Li III	10.34	10.29	119.907571	120.490212	0.582641	0.583	
Li III	10.29		120.490212			0.000	

L3-2 Series	Larger	Next Shorter	Larger	Next Shorter	Transition	Rounded	Difference
Antinode Number	Wavelength	Wavelength	ʎ in eV	ʎ in eV	Energy eV	Energy eV	eV Between Series
Li III	72.91	54	17.0051335	22.9600794	5.9549459	5.955	
Li III	54	48.3	22.9600794	25.669654	2.7095746	2.710	17.01
Li III	48.3	45.6	25.669654	27.1895677	1.5199137	1.520	16.96
Li III	45.6		27.1895677				16.99

L3-3 Series	Larger	Next Shorter	Larger	Next Shorter	Transition	Rounded	Difference
Antinode Number	Wavelength	Wavelength	ʎ in eV	ʎ in eV	Energy eV	Energy eV	eV Between Series
Calculated	208.4	142.4	5.95	8.70677169	2.7567717	2.757	
Li III	142.4	121.5	8.70677169	10.2044797	1.497708	1.498	
Li III	121.5		10.2044797			0.000	

Table 15. Table of Lithium III series energy of antinodes.

Lithium III		Energy in eV	May contain electrons in energy states in eV		
Number			Li III-1	Li III-2	Li III-3
99A	Antinode				
99N	Node	0	Ground		
100A	Antinode	91.782			
100N	Node	0	91.84	Ground	
101A	Antinode	17.001			
101N	Node	0	108.85	17.01	Ground
102A	Antinode	5.940			
102N	Node	0	114.80	22.96	5.96
103A	Antinode	2.754			
103N	Node	0	117.52	25.67	8.71
104A	Antinode	1.494			
104N	Node	0	119.101	27.19	10.20

Table 16. Table showing excitation of electrons in Lithium III

The proton-wave antinode energy levels of Neutral Hydrogen appear in Lithium II and Lithium I. In Lithium I, the electrons travel through lower energy antinodes when compared to Hydrogen thereby extending the size of the atom as far as matter is concerned.

In Lithium II, we see an interesting pattern arise in Table 17. In Lithium II, we have a Helium II superposition of two proton-waves upon which only one electron travels i.e. a single electron polarizes two proton-waves toward itself. And in the same Lithium II atom, we have a Hydrogen-type proton-wave upon which the other electron travels. This other electron has polarized one proton-wave to itself. The Lithium II nucleon waves take the form of two proton-waves in spherical superposition and a single proton-wave in the manner of Hydrogen emanating from the nucleus. We will see from nature that the atom has coherent waves despite the number of nucleons and that the electron is plane-polarizing the wave or waves toward itself.

Lithium II

L2-1 Series	Larger	Next Shorter	Larger	Next Shorter	Transition	Rounded	Difference
Antinode	Wavelength	Wavelength	ʎ in eV	ʎ in eV	Energy eV	Energy eV	eV Between Series
Li II	19.928	17.8014	62.2161927	69.6486955	7.4325028	7.433	He II-type
Li II	17.8014	17.1575	69.6486955	72.2625259	2.6138304	2.614	
Li II	17.1575	16.874	72.2625259	73.4766083	1.214	1.214	61.3086767
Li II	16.874	16.721	73.4766083	74.1489318	0.6723235	0.672	61.2959555

L2-3 Series	Larger	Next Shorter	Larger	Next Shorter	Transition	Rounded	
Antinode	Wavelength	Wavelength	ʎ in eV	ʎ in eV	Energy eV	Energy eV	

Li II	113.188	101.788	10.9538492	12.1806528	1.2268036	1.227	He II-type
Li II	101.788	96.5	12.1806528	12.8481273	0.6674745	0.667	
Li II	96.5	93.6	12.8481273	13.2461996	0.3980723	0.398	
Li II	93.6	91.75	13.2461996	13.5132892	0.2670896	0.267	
Li II	91.75	90.55	13.5132892	13.692372	0.1790828	0.179	

L2-2 Series	Larger	Next Shorter	Larger	Next Shorter	Transition	Rounded	
Antinode	Wavelength	Wavelength	ʎ in eV	ʎ in eV	Energy eV	Energy eV	
Li II	96.5	80	12.8481273	15.4980536	2.6499263	2.650	He II-type

L2-4 Series						Rounded	
Antinode						Energy eV	
Li II	273.047	238.3199	4.54077242	5.20243709	0.66166467	0.662	H-type
Li II	238.3199	224.921	5.20243709	5.51235451	0.30991742	0.310	H-type
Li II	224.921	218.3	5.51235451	5.67954324	0.16718873	0.167	H-type

Table 17. Table showing energy of antinodes of Lithium II series.

We can see by putting the values in a table of antinodes (Table 18) how we arrive at the ionization energy, because the electron in ground state has 21.40 eV of energy.

Lithium II		Energy in eV	May contain electrons in energy states in eV				
Number		First Nucleon Wave	Li II-1	Li II-2	Li II-3	Second Nucleon Wave	Li II-4
99A	Antinode					≈ 85 eV	
99N	Node	0	21.40			0	
100A	Antinode	40.81				10.19	
100N	Node	0	62.22			0	
101A	Antinode	7.56				1.89	
101N	Node	0	69.65	12.85		0	4.54
102A	Antinode	2.65				0.66	
102N	Node	0	72.26	15.49	10.95	0	5.20
103A	Antinode	1.22				0.31	
103N	Node	0	73.48		12.18	0	5.51
104A	Antinode	0.67				0.17	
104N	Node	0			12.85	0	
105A	Antinode	0.40				0.10	
105N	Node	0			13.25	0	
106A	Antinode	0.26				0.066	
106N	Node	0			13.51	0	

Table 18. Table showing excitation of electrons in Lithium II

Whereas, Lithium I takes the formation of three separate Hydrogen-like proton-waves as seen in Table 19.

LI-1 Series	Larger	Next Shorter	Larger	Next Shorter	Transition	Rounded
Antinode	Wavelength	Wavelength	ʎ in eV	ʎ in eV	Energy eV	Energy eV
Li I	323.2633	274.12	3.8354007	4.52299828	0.68759758	0.688
Li I	274.12	256.231	4.52299828	4.83877551	0.31577723	0.316
Li I	256.231	247.506	4.83877551	5.00935043	0.17057492	0.171
Li I	247.506	242.543	5.00935043	5.11185352	0.10250309	0.103
Li I	242.543	239.439	5.11185352	5.17812173	0.06626821	0.066
Li I	239.439	237.354	5.17812173	5.22360815	0.04548642	0.045
Li I	237.354	235.893	5.22360815	5.25596049	0.03235234	0.032
Li I	235.893	234.822	5.25596049	5.27993241	0.02397192	0.024
Li I	234.822	234.015	5.27993241	5.29814024	0.01820783	0.018
Li I	234.015	233.394	5.29814024	5.3122372	0.01409696	0.014
Li I	233.394	232.902	5.3122372	5.32345917	0.01122197	0.011
Li I	232.902	232.511	5.32345917	5.33241132	0.00895215	0.009

LI-2 Series	Larger	Next Shorter	Larger	Next Shorter	Transition	Rounded
Antinode	Wavelength	Wavelength	ʎ in eV	ʎ in eV	Energy eV	Energy eV
Li I	391.535	379.472	3.16662441	3.26728794	0.10066353	0.101
Li I	379.472	371.87	3.26728794	3.334	0.06671206	0.067
Li I	371.87	366.2	3.334	3.38	0.046	0.046

Table 19. Table showing antinode energy of Lithium I

We can arrive at the ionization energy shown in table 20.

Lithium I		Energy eV	electron energy eV	
Number			Li I-1	Li I-1
99A	Antinode	≈ 85 eV		
99N	Node	0		
100A	Antinode	10.198		
100N	Node	0	1.95	
101A	Antinode	1.89		
101N	Node	0	3.84	
102A	Antinode	0.66		
102N	Node	0	4.50	
103A	Antinode	0.31		
103N	Node	0	4.84	
104A	Antinode	0.17		
104N	Node	0	5.01	3.166
105A	Antinode	0.10		
105N	Node	0	5.11	3.267
106A	Antinode	0.066		
106N	Node	0	5.18	3.334
107A	Antinode	0.045		
107N	Node	0	5.22	

Lithium I	
13.598	Rydberg Energy
-10.198	Less antinode
3.40	Subtotal
+1.95	Ground state energy
5.35	Calc. Ionization Energy

108A	Antinode	0.032		
108N	Node	0	5.26	

Table 20. Table showing excitation of electrons in Lithium I and calculation of ionization energy from spectral lines.

Lithium II

Antinodes in eV	
40.7920	
7.5569	
2.6449	
1.2244	
0.6648	
0.4008	
0.2600	
0.1784	
0.1276	
0.0944	
0.0760	
0.0568	
54.0770	**Subtotal**
etc.	**Add all antinodes**
54.39360	**H*4=Rydberg Energy**
+21.40	**Ground State energy**
75.79360	**Calculated Ionization energy**
75.64	**NIST ionization**

Lithium I

Antinodes in eV	
1.8892	
0.6612	
0.3061	
0.1662	
0.1002	
0.0650	
0.0446	
0.0319	
0.0236	
0.0190	
0.0142	
0.0097	
3.3310	**Subtotal**
13.59	**Rydberg Energy**
-10.19	**Less antinode**
3.4	**Subtotal**
+1.95	**Ground state energy**
5.35	**Calculated Ionization Energy**
5.391714	**NIST ionization**

Table 21. Tables showing energy in antinodes of Lithium II, Lithium I, and calculation of ionization from spectral lines.

We can describe the laws of Hydrogen, Helium, and Lithium III as:

For Neutral Hydrogen: The excess energy of the electron stored in its electron-wave is equal to the antinodes of the proton-wave that the electron transitions through and at ground state the electron-wave has zero excess energy.

For Helium I: The energy of the antinodes is approximately equal to the proton-wave of Neutral Hydrogen, but the ground state energy is equal to 11.02 eV and therefore the transition energies are higher than Neutral Hydrogen. The two electrons share the energy of the node.

For Helium II: The nucleon-waves are coherent and in spherical superposition and the electron polarizes the two proton-waves toward itself so that the energy of the antinodes is four times that of the antinodes of the proton-wave in Neutral Hydrogen.

For Lithium III: The nucleon-waves are in spherical superposition and the energy of the antinodes is nine times that of the antinodes of the proton-wave in Neutral Hydrogen.

Table 22 shows the pattern that the whole periodic table follows as regards to formation of the proton-waves in each element according to the number of electrons of that element.

Element	Formation of nucleon waves	Electrons
Hydrogen	(1) H-type proton-wave	1

Helium II	(2) waves form (1) polarized proton-wave	1
Helium I	(2) H-type proton-waves	2
Lithium III	(3) waves form (1) polarized proton-wave	1
Lithium II	(1) Helium II wave and (1) Hydrogen wave	2
Lithium I	(3) H-type proton-waves	3

Table 22. Comparison of types of proton waves with respect to other ions and neutral atoms.

We can deduce from this emerging pattern that the rule for all atoms of all elements is that each electron pairs with one proton-wave creating a neutral electron-proton pair until the final electron pairs with any remaining proton-waves which makes the remaining waves into a single coherent proton-wave polarized toward that remaining electron. Ions contain at least one unequal electron-proton pairing and therefore have a higher ionization energy, because the unequal electron-proton pairing forms coherent proton-waves polarized to a single electron so that the proton-waves are in spherical superposition with associated higher energies.

The sections for Beryllium, Boron and Carbon follow[16]. The multi-polarized wave is easy to detect and a single series for each of these ions is shown in the sections below, but the Hydrogen-type wave is hypothesized in the "Formation of Nucleon Waves" table 23 for these higher elements, as it becomes increasingly more difficult to detect as there are not enough spectral lines in the NIST tables for each ion and neutral atom as the atoms become larger, and the Hydrogen-type wave where surmised for these higher elements and is shown in brackets in Table 23. The tables from here to Carbon speak for themselves by incorporating the energies of the Hydrogen proton-wave along with the energies of the previous elemental ions. The tables showing the ionization calculations for each element and its ions is also presented.

Element	Formation of Nucleon Waves	Electrons
Hydrogen	(1) H-type proton-wave	1
Helium II	(2) waves form (1) polarized proton-wave	1
Helium I	(2) H-type proton-waves	2
Lithium III	(3) waves form (1) polarized proton-wave	1
Lithium II	(1) Helium II wave and (1) Hydrogen wave	2
Lithium I	(3) H-type proton-waves	3
Beryllium IV	(4) waves form (1) polarized proton-wave	1
Beryllium III	(1) Lithium III wave [and (1) Hydrogen wave]	2
Beryllium II	(1) Helium II wave [and (2) Hydrogen]	3
Beryllium I	(4) H-type proton-waves	4
Boron V	(5) waves form (1) polarized proton-wave	1
Boron IV	(1) Be IV proton-wave [and (1) H wave]	2
Boron III	(1) Li III proton-wave [and (2) H waves]	3
Boron II	(1) He II proton-wave [and (3) H waves]	4
Boron I	(5) H-type proton-waves	5
Carbon VI	[(6) waves to (1) polarized proton-wave]	1
Carbon V	(1) B V proton-wave [and (1) H wave]	2
Carbon IV	(1) Be IV proton wave [and (2) H type waves]	3
Carbon III	(1) Li III proton-wave [and (3) H type waves]	4
Carbon II	(1) He II proton-wave [and (4) H type waves]	5
Carbon I	(6) H-type proton-waves	6

Table 23. Configuration of proton waves for each ion and neutral atom.

2.4 Beryllium

Beryllium-IV Antinode	Larger Wavelength	Next Shorter Wavelength	Larger ʎ in eV	Next Shorter ʎ in eV	Transition Energy eV	Rounded Energy eV	Difference eV Between
Be IV	8.932	7.593	138.8093	163.2878	24.47855	24.479	
Be IV	7.593	6.406	163.2878	193.5442	30.25642	30.256	163.168
Be IV	6.406	6.074	193.5442	204.1232	10.57897	10.579	163.168
Be IV	6.074	5.857	204.1232	209.030	4.9067	4.907	163.168
Calculated	5.931	5.857	209.030	211.6859	2.656	2.656	163.168
Be IV	5.857	5.813	211.6859	213.2882	1.602302	1.602	163.168
Be IV	5.813		213.2882				

Table 24. Spectral sequence of Beryllium-IV (Shaded yellow: spectral line is calculated and hypothesized.)

Beryllium-IV		Energy in eV	eV
Number			Be-IV
98A	Antinode		
98N	Node	0	Ground
99A	Antinode	163.168	
99N	Node	0	163.28
100A	Antinode	30.224	
100N	Node	0	193.54
101A	Antinode	10.560	
101N	Node	0	204.12
102A	Antinode	4.896	
102N	Node	0	209.03
103A	Antinode	2.656	
103N	Node	0	211.686

Table 25. Table showing energy of antinodes and excitation of electrons in Beryllium-IV

Beryllium-III Antinode	Larger Wavelength	Next Shorter Wavelength	Larger ʎ in eV	Next Shorter ʎ in eV	Transition Energy eV	Rounded eV	
Be III	10.025	8.831	123.6752	140.3968	16.72158	16.722	Li III type
Be III	8.831	8.476	140.3968	146.2771	5.880235	5.880	
Be III	8.476	8.32	146.2771	149.0197	2.742695	2.743	
Be III	8.32	8.238	149.0197	150.5031	1.483323	1.483	
Be III	8.238	8.189	150.5031	151.4036	0.900556	0.901	

Table 26. Spectral sequence of Beryllium-III

Beryllium-III		Energy in eV	eV
Number		Lithium III type wave	Be-III
98A	Antinode		
98N	Node	0	31.89
99A	Antinode	91.782	

99N	Node	0	123.68
100A	Antinode	17.001	
100N	Node	0	140.40
101A	Antinode	5.940	
101N	Node	0	146.28
102A	Antinode	2.754	
102N	Node	0	149.02
103A	Antinode	1.494	
103N	Node	0	150.50

Table 27. Table showing energy of antinodes and excitation of electrons in Beryllium-III

Beryllium IV		**Beryllium III**	
Antinode in eV		Antinode in eV	
163.168		91.7820	
30.224		17.0031	
10.560		5.9510	
4.896		2.7549	
2.656		1.4958	
1.600		0.9018	
1.040		0.5850	
0.704		0.4014	
0.512		0.2871	
0.384		0.2124	
0.288		0.1710	
0.224		0.1278	
0.160		0.0873	
216.4160	**Subtotal**	121.7606	**Subtotal**
etc.	**Add all antinodes**	etc.	**Add all antinodes**
217.5744	**Rydberg Energy H*16**	122.3856	**Rydberg Energy H*9**
		31.89	**Ground state energy**
217.719	**NIST ionization**	154.2788	**Calculated Ionization Energy**
		153.896	**NIST ionization**

Table 28. Calculation of ionization from the spectrum and comparison to NIST.

Beryllium-II	Larger	Next Shorter	Larger	Next Shorter	Transition	Rounded	
Antinode	Wavelength	Wavelength	ʎ in eV	ʎ in eV	Energy eV	Energy eV	
Be II	151.24	114.3039	8.19779457	10.8469	2.64912	2.649	He II
Be II	114.3	102.6926	10.8469115	12.0734	1.22644	1.226	type
Be II	102.69	97.3266	12.0733557	12.739	0.66565	0.666	
Be II	97.327	94.3559	12.7390075	13.1401	0.40107	0.401	
Be II	94.356	92.5246	13.1400822	13.4002	0.26008	0.260	

Table 29. Spectral sequence of Beryllium-II

Beryllium-II		Energy in eV	eV
Number		Helium II type wave	Be-II
98A	Antinode		
98N	Node	0	
99A	Antinode	40.810	
99N	Node	0	0.64
100A	Antinode	7.558	
100N	Node	0	8.19779
101A	Antinode	2.645	
101N	Node	0	10.8469
102A	Antinode	1.224	
102N	Node	0	12.0734
103A	Antinode	0.665	
103N	Node	0	12.739
104A	Antinode	0.401	
104N	Node	0	13.1401

Table 30. Table showing energy of antinodes and excitation of electrons in Beryllium-II

Beryllium I	Larger	Next Shorter	Larger	Next Shorter	Transition	Rounded	
Antinode	Wavelength	Wavelength	ʎ in eV	ʎ in eV	Energy eV	Energy eV	
Be I	166.1478	149.1762	7.462297	8.311274	0.848977	0.849	H-type
Be I	149.1762	142.6117	8.311274	8.693847	0.382573	0.383	
Be I	142.6117	139.39	8.693847	8.894786	0.20094	0.201	
Be I	139.39	137.56	8.894786	9.013116	0.11833	0.118	
Be I	137.56	136.43	9.013116	9.087769	0.074652	0.075	
Be I	136.43	135.65	9.087769	9.140024	0.052256	0.052	
Be I	135.65	135.13	9.140024	9.175196	0.035172	0.035	
Be I	135.13	134.74	9.175196	9.201754	0.026557	0.027	
Be I	134.74	134.47	9.201754	9.22023	0.018476	0.018	
Be I	134.47	134.22	9.22023	9.237403	0.017174	0.017	

Table 31. Spectral sequence of Beryllium-I

Beryllium-I		Energy in eV	eV
Number			Be-I
98A	Antinode		
98N	Node	0	
99A	Antinode	10.198	
99N	Node	0	5.57
100A	Antinode	1.889	
100N	Node	0	7.46
101A	Antinode	0.660	
101N	Node	0	8.31
102A	Antinode	0.306	

102N	Node	0	8.69
103A	Antinode	0.166	
103N	Node	0	8.89
104A	Antinode	0.100	
104N	Node	0	9.01
105A	Antinode	0.065	

Table 32. Table showing energy of antinodes and excitation of electrons in Beryllium-I

Beryllium II

Antinode in eV	
40.7920	
7.5569	
2.6449	
1.2244	
0.6648	
0.4008	
0.2600	
0.1784	
0.1276	
0.0944	
0.0760	
0.0568	
0.0388	
54.116	**Subtotal**
etc.	**Add all antinodes**
54.394	**H*4=Rydberg Energy**
-40.792	**Less antinode**
13.602	**Subtotal**
0.64	**Ground state energy**
14.241	**Calculated Ionization Energy**
18.211	**NIST ionization**

Beryllium I

Antinode in eV	
1.8892	
0.6612	
0.3061	
0.1662	
0.1002	
0.0650	
0.0446	
0.0319	
0.0236	
0.0190	
0.0142	
0.0097	
3.3310	**Subtotal**
13.598	**Rydberg Energy**
-10.198	**Less antinode**
3.4	**Subtotal**
5.571	**Ground state energy**
8.971	**Calculated Ionization Energy**
9.323	**NIST ionization**

Table 33. Calculation of ionization from the spectrum and comparison to NIST.

2.5 Boron

The following is an analysis of Boron.

Boron-V	Larger	Next Shorter	Larger	Next Shorter	Transition	Rounded	Difference
Antinode	Wavelength	Wavelength	ʎ in eV	ʎ in eV	Energy eV	Energy eV	eV Between
B V	4.859	4.098	255.164496	302.54863	47.384134	47.384	
B V	4.098	3.887	302.54863	318.972032	16.423402	16.423	255.3
B V	3.887	3.794	318.972032	326.790798	7.818766	7.819	255.2

B V	3.794	3.748	326.790798	330.801571	4.010773	4.011	255.3
B V	3.748	3.721	330.801571	333.201905	2.400334	2.400	255.2
B V	3.721	3.703	333.201905	334.821574	1.619669	1.620	

B V	26.24	19.44	47.2501634	63.7779984	16.527835	16.528	
B V	19.44	17.35	63.7779984	71.4607659	7.6827675	7.683	47.24
B V	17.35	16.4	71.4607659	75.6002615	4.1394956	4.139	47.26
B V	16.4	15.87	75.6002615	78.1250339	2.5247724	2.525	47.25

B V	74.97	51.23	16.5378723	24.2015281	7.6636558	7.664	
B V	51.23	43.74	24.2015281	28.345777	4.1442489	4.144	

Table 35. Spectral sequence of Boron-V

Boron V		Energy in eV	May contain electrons in energy states in eV		
Number			B V-1	B V-2	B V-3
99A	Antinode				
99N	Node	0	Ground		
100A	Antinode	255			
100N	Node	0	255.16	Ground	
101A	Antinode	47.2			
101N	Node	0	302.55	47.25	Ground
102A	Antinode	16.5			
102N	Node	0	318.97	63.78	16.53
103A	Antinode	7.7			
103N	Node	0	326.79	71.46	24.20
104A	Antinode	4.2			
104N	Node	0	330.8016	75.60	
105A	Antinode	2.5			
105N	Node	0	333.202	78.13	
106A	Antinode	1.63			
106N	Node	0	334.822		

Table 36. Table showing energy of antinodes and excitation of electrons in Boron-V

Boron-IV Antinode	Larger Wavelength	Next Shorter Wavelength	Larger ƛ in eV	Next Shorter ƛ in eV	Transition Energy eV	Rounded Energy eV	Difference eV Between
B IV	4.8437	4.335	255.970495	286.007909	30.037414	30.037	

B IV	6.03144	5.26853	205.563561	235.330213	29.766652	29.767	Be IV
B IV	5.26853	5.04347	235.330213	245.831597	10.501384	10.501	
B IV	5.04347	5.019	245.831597	250.702011	4.870414	4.870	

B IV	25.989	24.602	47.7065023	50.3960771	2.6895748	2.690	
B IV	24.602	23.771	50.3960771	52.1578515	1.7617744	1.762	
B IV	23.771	23.308	52.1578515	53.1939372	1.0360857	1.036	
B IV	23.308	23	53.1939372	53.9062734	0.7123362	0.712	

Table 37. Spectral sequence of Boron-IV

Boron IV		Energy in eV	May contain electrons in energy states in eV		
Number			B IV-1	B IV-2	B IV-3
99A	Antinode				
99N	Node	0	42.40		
100A	Antinode	163			
100N	Node	0	205.56		
101A	Antinode	30.2			
101N	Node	0	235.33		
102A	Antinode	10.6			
102N	Node	0	245.83		
103A	Antinode	4.9			
103N	Node	0	250.70	47.70	
104A	Antinode	2.7			
104N	Node	0		50.40	
105A	Antinode	1.6			
105N	Node	0		52.16	
106A	Antinode	1.04			
106N	Node	0		53.19	
107A	Antinode	0.70			
107N	Node	0		53.90	

Table 38. Table showing energy of antinodes and excitation of electrons in Boron-IV

Ionization	
B IV	
217.44	Rydberg * 16
42.4	Ground state
259.84	Calculated
259.3715	NIST

Table 39. Calculation of ionization from the spectrum and comparison to NIST

Boron-III	Larger	Next Shorter	Larger	Next Shorter	Transition	Rounded	Difference
Antinode	Wavelength	Wavelength	ʎ in eV	ʎ in eV	Energy eV	Energy eV	eV Between
B III	36.569	33.83	33.9042437	36.6492547	2.745011	2.745	Li III

B III	33.83	32.433	36.6492547	38.2278632	1.5786085	1.579	
B III	32.433	31.654	38.2278632	39.168645	0.9407818	0.941	

B III	39.841	38.014	31.1198084	32.615465	1.4956566	1.496	

B III	43.4627	42.129	28.5266283	29.4297108	0.9030825	0.903	Li III
B III	42.129	41.305	29.4297108	30.0168088	0.587098	0.587	
B III	41.305	40.76	30.0168088	30.4181621	0.4013533	0.401	

B III	49.34	47.542	25.128583	26.0789257	0.9503427	0.950	Li III
B III	47.542	46.557	26.0789257	26.630674	0.5517483	0.552	
B III	46.557	45.8729	26.630674	27.0278157	0.3971417	0.397	

Table 39. Spectral sequence of Boron-III

Boron III		Energy in eV	May contain electrons in energy states in eV		
Number			B III-1	B III-2	B III-3
99A	Antinode				
99N	Node	0			
100A	Antinode	91.8			
100N	Node	0	10.96		
101A	Antinode	17.0			
101N	Node	0	27.96		
102A	Antinode	5.94			
102N	Node	0	33.90		
103A	Antinode	2.75			
103N	Node	0	36.65		
104A	Antinode	1.49			
104N	Node	0	38.23	28.43	25.13
105A	Antinode	0.900			
105N	Node	0		29.43	26.08
106A	Antinode	0.585			
106N	Node	0		30.02	26.63

Table 40. Table showing energy of antinodes and excitation of electrons in Boron-III

B III Ionization

122.39	Rydberg
-91.782	less antinode
30.60	Subtotal
10.96	Ground state
41.56	Calculated

ionization

37.93058 NIST

Table 40. Calculation of ionization from the spectrum and comparison to NIST

Boron-II	Larger	Next Shorter	Larger	Next Shorter	Transition	Rounded	Difference
Antinode	Wavelength	Wavelength	ʎ in eV	ʎ in eV	Energy eV	Energy eV	eV Between
B II	51.13	49.78	24.2488615	24.9064742	0.6576127	0.658	He II
B II	49.78	48.946	24.9064742	25.3308603	0.4243861	0.424	
B II	48.946	48.4	25.3308603	25.6166175	0.2857572	0.286	
B II	48.4	48.035	25.6166175	25.8112686	0.1946511	0.195	
B II	48.035	47.79	25.8112686	25.9435925	0.1323239	0.132	
B II	47.79	47.604	25.9435925	26.0449602	0.1013677	0.101	
B II	47.604	47.457	26.0449602	26.1256356	0.0806754	0.081	
B II	47.457	47.352	26.1256356	26.1835675	0.0579319	0.058	
B II	77.08	68.722	16.085162	18.0414465	1.9562845	1.956	H-type
B II	68.722	66.3066	18.0414465	18.6986557	0.6572092	0.657	
B II	66.3066	65.064	18.6986557	19.0557649	0.3571092	0.357	
B II	65.064	64.56	19.0557649	19.2045274	0.1487625	0.149	
B II	64.56	64.158	19.2045274	19.3248587	0.1203313	0.120	
B II	108.2073	88.2543	11.4580466	14.0485425	2.5904959	2.590	He II
B II	88.2543	80.915	14.0485425	15.3227991	1.2742566	1.274	
B II	80.915	77.529	15.3227991	15.9920067	0.6692076	0.669	

Table 41. Spectral sequence of Boron-II

Boron II		Energy in eV	May contain electrons in energy states in eV			Energy in eV	
Number		He II-type	B II-1	B II-2	B II-3	H-type	B II-4
99A	Antinode					0	5.89
99N	Node	0				10.20	
100A	Antinode	40.81				0	16.09
100N	Node	0		3.90		1.89	
101A	Antinode	7.558				0	18.04
101N	Node	0		11.46		0.66	
102A	Antinode	2.645				0	18.70
102N	Node	0		14.05		0.31	
103A	Antinode	1.224				0	19.06
103N	Node	0	24.24	15.32		0.17	
104A	Antinode	0.665				0	19.20
104N	Node	0	24.91			0.10	

105A	Antinode	0.401				0	
105N	Node	0	25.33			0.065	
106A	Antinode	0.26				0	
106N	Node	0	25.62			0.044	
107A	Antinode	0.178				0	
107N	Node	0	25.81			0.032	
108A	Antinode	0.128				0	
108N	Node	0	25.94			0.024	
108A	Antinode	0.096				0	
108N	Node	0	26.04			0.018	

Table 42. Table showing energy of antinodes and excitation of electrons in Boron-II

B II Ionization

54.39360	Rydberg
-40.81	less antinode
-7.558	
-2.645	
3.38060	subtotal eV
24.24	Ground state
27.62060	Calculated

25.15483 NIST

Table 43. Calculation of ionization from the spectrum and comparison to NIST

Boron-I Antinode	Larger Wavelength	Next Shorter Wavelength	Larger ʎ in eV	Next Shorter ʎ in eV	Transition Energy eV	Rounded Energy eV	Difference eV Between
B I	249.7722	181.7843	4.96390026	6.82041457	1.85651431	1.857	H-type
B I	182.64	166.685	6.78845975	7.43824752	0.64978777	0.650	H-type
B I	181.7843	166.7272	6.82041457	7.43636484	0.61595027	0.616	
B I	624.466	594.263	1.98544722	2.08635619	0.10090897	0.101	H-type
B I	594.263	573.1943	2.08635619	2.16304364	0.07668745	0.077	
B I	573.1943	563.3069	2.16304364	2.2010103	0.03796666	0.038	
B I	564.4321	556.3185	2.19662256	2.2286591	0.03203654	0.032	
B I	556.3185	550.4565	2.2286591	2.25239285	0.02373375	0.024	

Table 44. Spectral sequence of Boron-I

Boron I		Energy in eV	May contain electrons in energy states in eV			
Number			B I-1		B I-2	B I-3

99A	Antinode					
99N	Node	0				
100A	Antinode	10.198				
100N	Node	0	4.96	4.90		
101A	Antinode	1.889				
101N	Node	0	6.82	6.79		
102A	Antinode	0.66				
102N	Node	0	7.48			
103A	Antinode	0.306				
103N	Node	0				
104A	Antinode	0.166				
104N	Node	0			1.985	
105A	Antinode	0.100				
105N	Node	0			2.086	
106A	Antinode	0.065				
106N	Node	0			2.163	
107A	Antinode	0.044				
107N	Node	0			2.196	
108A	Antinode	0.032				
108N	Node	0			2.229	

Table 45. Table showing energy of antinodes and excitation of electrons in Boron-I

B I	Ionization	
	13.590	Rydberg
	-10.198	Less antinode
	3.392	Subtotal eV
	4.96390026	Ground state
	8.356	Calculated ionization
B I	8.298019	NIST

Table 46. Calculation of ionization from the spectrum and comparison to NIST

2.6 Carbon

The difference of the size of the nucleus becomes more pronounced in Carbon affecting the energy of the antinodes of the hydrogen-type proton-wave and the other superpositioned proton-waves. However, the pattern is still very clear.

Carbon I	Larger	Next Shorter	Larger	Next Shorter	Transition	Rounded
Antinode	Wavelength	Wavelength	ʎ in eV	ʎ in eV	Energy eV	Energy eV
C I	127.73	119.339	9.7069	10.389	0.682	0.682
C I	119.34	115.804	10.389	10.706	0.317	0.317

Carbon I	Larger	Next Shorter	Larger	Next Shorter	Transition	Rounded
Antinode	Wavelength	Wavelength	ʎ in eV	ʎ in eV	Energy eV	Energy eV
C I	193.09	148.176	6.4211	8.3674	1.946	1.946

C I	148.18	136.416	8.3674	9.0887	0.721	0.721
C I	136.42	131.136	9.0887	9.4546	0.366	0.366

Carbon I	Larger	Next Shorter	Larger	Next Shorter	Transition	Rounded
Antinode	Wavelength	Wavelength	ʎ in eV	ʎ in eV	Energy eV	Energy eV
C I	600.11	505.217	2.066	2.4541	0.388	0.388
C I	505.22	477.175	2.4541	2.5983	0.144	0.144

Carbon I	Larger	Next Shorter	Larger	Next Shorter	Transition	Rounded
Antinode	Wavelength	Wavelength	ʎ in eV	ʎ in eV	Energy eV	Energy eV
C I	786.09	658.761	1.5772	1.8821	0.305	0.305
C I	658.76	601.484	1.8821	2.0613	0.179	0.179

Carbon I	Larger	Next Shorter	Larger	Next Shorter	Transition	Rounded
Antinode	Wavelength	Wavelength	ʎ in eV	ʎ in eV	Energy eV	Energy eV
C I	1814	1261.41	0.6835	0.9829	0.299	0.299
C I	1261.4	1068.31	0.9829	1.1606	0.178	0.178
C I	1068.3	965.844	1.1606	1.2837	0.123	0.123
C I	965.84	910.573	1.2837	1.3616	0.078	0.078

Table 47. Spectral sequence of Carbon-I

Carbon I		Energy in eV	May contain electrons in energy states in eV				
Number			C I-1	C I-2	C I-3	C I-4	C I-5
99A	Antinode						
99N	Node	0					
100A	Antinode	10.198					
100N	Node	0	7.82	6.48			
101A	Antinode	1.889					
101N	Node	0	9.71	8.37			
102A	Antinode	0.660					
102N	Node	0	10.39	9.09	2.07	1.58	0.68
103A	Antinode	0.306					
103N	Node	0	10.70	9.45	2.45	1.88	0.98
104A	Antinode	0.166					
104N	Node	0					1.16
105A	Antinode	0.101					
105N	Node	0					1.28
106A	Antinode	0.065					
106N	Node	0					
107A	Antinode	0.045					
107N	Node	0					
108A	Antinode	0.032					
108N	Node	0					

Table 48. Table showing energy of antinodes and excitation of electrons in Carbon-I

Carbon I

13.59	Ryberg Energy
-10.20	less antinode
3.39	Subtotal
7.82	Ground state
11.21	Calculated ionization energy
11.26	NIST Ionization

Table 49. Calculation of ionization from the spectrum and comparison to NIST

Carbon II	Larger	Next Shorter	Larger	Next Shorter	Transition	Rounded	Difference
Antinode	Wavelength	Wavelength	ƛ in eV	ƛ in eV	Energy eV	Energy eV	eV Between
C II	90.448	90.4142	13.7078	20.8369	7.129136	7.129	11.99447

Carbon II	Larger	Next Shorter	Larger	Next Shorter	Transition	Rounded	Difference
Antinode	Wavelength	Wavelength	ƛ in eV	ƛ in eV	Energy eV	eV	
C II	723.642	723.132	1.71334	9.2823	7.568961	7.569	He II type
C II	133.5708	103.7018	9.2823	11.9559	2.67356	2.674	
C II	103.7018	90.448	11.9559	13.7078	1.751952	1.752	
C II	90.3624	85.8559	13.7208	14.441	0.720193	0.720	

Table 50. Spectral sequence of Carbon-II

Carbon II		Energy in eV	eV	
Number			C II-1	C II-2
99A	Antinode	≈ 340 eV		
99N	Node	0		
100A	Antinode	40.81		
100N	Node	0	13.71	1.71
101A	Antinode	7.56		
101N	Node	0	20.84	9.28
102A	Antinode	2.65		
102N	Node	0		11.96
103A	Antinode	1.22		
103N	Node	0		13.71
104A	Antinode	0.67		
104N	Node	0		14.441

Table 51. Table showing energy of antinodes and excitation of electrons in Carbon-II

Carbon II

54.39	Rydberg *4
-40.81	less antinode
13.58	Subtotal
13.71	Ground state

27.29	Calculated ionization
24.3845	NIST ionization

Table 52. Calculation of ionization from the spectrum and comparison to NIST

Carbon III	Larger	Next Shorter	Larger	Next Shorter	Transition	Rounded	
Antinode	Wavelength	Wavelength	ʎ in eV	ʎ in eV	Energy eV	eV	
C III	45.0734	38.6203	27.5072	33.3569	5.849717	5.850	Li III type

Carbon III	Larger	Next Shorter	Larger	Next Shorter	Transition	Rounded	
Antinode	Wavelength	Wavelength	ʎ in eV	ʎ in eV	Energy eV	eV	
C III	57.4281	45.0734	21.5895	27.5072	5.917722	5.918	

Carbon III	Larger	Next Shorter	Larger	Next Shorter	Transition	Rounded	
Antinode	Wavelength	Wavelength	ʎ in eV	ʎ in eV	Energy eV	eV	
C III	272.59	117.637	4.54839	10.5396	5.991192	5.991	

Carbon III	Larger	Next Shorter	Larger	Next Shorter	Transition	Rounded	
Antinode	Wavelength	Wavelength	ʎ in eV	ʎ in eV	Energy eV	eV	
C III	466.586	298.211	2.65727	4.15761	1.500339	1.500	

Table 53. Spectral sequence of Carbon-III

Carbon III		Energy in eV	eV		
Number			C III-1	C III-2	C III-3
99A	Antinode				
99N	Node	0			
100A	Antinode	91.8			
100N	Node	0	10.51	4.59	
101A	Antinode	17.0			
101N	Node	0	27.51	21.59	
102A	Antinode	5.94			
102N	Node	0			
103A	Antinode	2.75			
103N	Node	0			2.66

Table 54. Table showing energy of antinodes and excitation of electrons in Carbon-III

Carbon III	
122.3856	Rydberg *9
-91.782	less antinode
30.6036	subtotal
10.51	ground state
41.1136	Calculated
47.88778	NIST

Table 55. Calculation of ionization from the spectrum and comparison to NIST

Carbon IV	Larger	Next Shorter	Larger	Next Shorter	Transition	Rounded	Difference

Antinode	Wavelength	Wavelength	ʎ in eV	ʎ in eV	Energy eV	Energy eV	eV Between Series
C IV	41.971	31.246	29.5405	39.6801	10.1396	10.140	
C IV	41.952		29.55388			0.000	
C IV	38.418		32.27248			0.000	
C IV	38.403		32.28509			0.000	
C IV							
C IV	31.246	24.491	39.6801	50.62449	10.94439	10.944	
C IV	31.242		39.68518			0.000	
C IV	28.923		42.86707			0.000	
C IV	28.914		42.88041			0.000	
C IV	24.491		50.62449				

Table 56. Spectral sequence of Carbon-IV

Carbon IV		Energy in eV	eV	
Number			C IV-1	C IV-2
99A	Antinode			
99N	Node	0		
100A	Antinode	163.17		
100N	Node	0		9.46
101A	Antinode	30.22		
101N	Node	0	29.5405	39.6801
102A	Antinode	10.5		
102N	Node	0		
103A	Antinode	4.89		
103N	Node	0		
104A	Antinode	2.66		
104N	Node	0		
105A	Antinode	1.61		
105N	Node	0		

Table 57. Table showing energy of antinodes and excitation of electrons in Carbon-IV

217.719	Rydberg * 16
-163.17	antinode
54.549	Subtotal
9.46	Ground state
64.009	Calculated ionization
64.49351	NIST

Table 58. Calculation of ionization from the spectrum and comparison to NIST

Carbon V has too few spectral lines to recognize a series from the NIST webpages available in 2017 and Carbon VI has no spectral lines listed on the NIST webpages.

2.7 Deuterium

The neutron-wave, which can be deduced from an examination of Deuterium, increases the energy of the proton-wave transitions. The counter-effect of multiple nucleons enlarging the great sphere of energy in the first antinode around the nucleus lessens the overall energy of the proton-wave as a portion of the proton-wave is inside the nucleus.

Deuterium

Deuterium	Larger	Next Shorter	Larger	Next Shorter	Transition	Rounded	Difference
Antinode	Wavelength	Wavelength	ʎ in eV	ʎ in eV	Energy eV	Energy eV	eV Between Series
D	121.5338	102.5427	10.20164	12.091	1.88923	1.889	
Calculated	102.5427	97.23506	12.091	12.752	0.66122	0.661	10.20113
Calculated	97.23506	94.94848	12.752	13.05807	0.305982	0.306	10.20095
D	94.94848	93.75484	13.05807	13.22432	0.166249	0.166	10.20079
D	93.75484	93.0495	13.22432	13.32457	0.100244	0.100	10.20075
D	93.0495	92.28992	13.32457	13.38967	0.0651	0.065	10.20072
Calculated	92.59709	92.28992	13.38967	13.43423	0.044566	0.045	10.20074
D	92.28992	92.07125	13.43423	13.46614	0.031906	0.032	10.20068
D	92.07125	91.91013	13.46614	13.48975	0.023607	0.024	10.20067
D	91.91013	91.78796	13.48975	13.5077	0.017955	0.018	10.20067

Deuterium	Larger	Next Shorter	Larger	Next Shorter	Transition	Rounded	Difference
Antinode	Wavelength	Wavelength	ʎ in eV	ʎ in eV	Energy eV	Energy eV	eV Between Series
D	656.0925	486.0039	1.88974	2.551099	0.661359	0.661	
D	485.9956	433.9314	2.551143	2.857236	0.306093	0.306	
D	433.9246	410.0647	2.85728	3.023533	0.166253	0.166	
D	410.0586	396.9019	3.023578	3.123805	0.100227	0.100	
D	396.8962	388.8016	3.12385	3.188887	0.065037	0.065	
D	388.7961	383.4367	3.188932	3.233505	0.044573	0.045	
D	383.4313	379.6842	3.23355	3.265462	0.031912	0.032	
D	379.6842	374.911	3.265462	3.289072	0.02361	0.024	
D	376.9587	374.911	3.289072	3.307037	0.017965	0.018	

Table 59. Spectral sequence of Carbon-IV (Shaded yellow are calculated and hypothesized.)

The differences between Hydrogen and Deuterium in the calculation of the neutron-wave are as follows:

Neutron-wave

Hydrogen	Deuterium	Hydrogen	Deuterium	Difference		Difference
Wavelength	Wavelength	ʎ in eV	ʎ in eV	Energy eV	Neutron nodes	between nodes
121.566824	121.53379	10.1988704	10.2016426	0.0027722	0.0033475	0.00057530
102.57222	102.542741	12.0875251	12.091	0.0033475	0.0035322	0.00018470
97.25367	97.235063	12.7485604	12.752	0.0035322	0.0035506	0.00001840
94.9743	94.9484754	13.0545241	13.0580747	0.0035506	0.0035963	0.00004570

93.78034	93.7548369	13.2207271	13.2243234	0.0035963	0.0036252	0.00002890
93.07482	93.049497	13.3209421	13.3245673	0.0036252	0.0036814	0.00005620
92.62256	92.5970945	13.3859859	13.3896673	0.0036814		

Hydrogen Wavelength	Deuterium Wavelength	Hydrogen ʎ in eV	Deuterium ʎ in eV	Difference Energy eV	Neutron nodes	Difference between nodes
656.2711	656.09245	1.88922579	1.88974021	0.00051442	0.00070	0.00018386
486.1287	485.99564	2.55044454	2.55114282	0.00069828	0.00080	0.00010193
434.0462	433.92464	2.85648	2.85728021	0.00080021	0.00085	0.00005031
410.174	410.05862	3.02272764	3.02357816	0.00085052	0.00087	0.00002296
397.0072	396.89619	3.12297683	3.12385031	0.00087348	0.00089	0.00001833
388.9049	388.79614	3.18803977	3.18893158	0.00089181	0.00090	0.00001130
383.5384	383.43128	3.23264708	3.23355019	0.00090311		

Table 60. Calculation of calculation of the strength of a neutron wave in Deuterium.

The energy of the neutron-wave is small. Because of this, the NIST spectral line measurements would have to be accurate to several decimal places and not as I have calculated for estimations as was done here. Also, I may have chosen the wrong fine structure line in estimating values. A comparison of the Neutron-wave and how the proton-wave changes:

Neutron	**Neutron**	**Hydrogen**						
Deuterium Lyman	Deuterium Balmer	Antinodes	Comparison of proton-wave antinode energies					
		10.198	He I	Li II	Li I	Be I	B II	BI
0.0005753		1.889	1.868999					1.856514
0.0001847	0.0001839	0.661	0.65505	0.66166	0.68760	0.84898	0.65721	0.649788
0.0000184	0.0001019	0.306	0.30373	0.30992	0.31578	0.38257	0.35711	
0.0000457	0.0000503	0.1662	0.16520	0.16719	0.17057	0.20094	0.14876	
0.0000289	0.0000230	0.1002	0.09971		0.10250	0.11833	0.12033	0.100909
0.0000562	0.0000183	0.0651	0.06476		0.06627			0.076687
	0.0000113	0.0449	0.04442		0.04549			0.037967
		0.0318	0.03179		0.03235			0.032037
		0.0237						0.023734

Table 61. Table showing effect of Neutron-wave on proton-wave energies.

3. CONCLUSIONS

Obviously, the point of this new model of the atom was not to invalidate statistical mechanics developed by Boltzman, Einstein, Boze, et al. The point is to model a single atom according to the easily verifiable spectral data in order to progress beyond current QM theory and improve upon and unify the statistical methods developed for Quantum Mechanics and provide a way forward to a unified field theory. My intent was not only to describe a new model that answers how, but to really understand why nature behaves as it does. With that in mind, I will here present hypotheses and models based on Sollism Theory with the intent of understanding how the underlying mechanisms of the atom work relying heavily on logic and abstract reasoning with a view to uniting the macro world of causality and invariance with the micro world where these two classical ideas were discarded from the inception of Quantum Mechanics because the atom itself was not well understood when QM was developed from 1913 to 1932. Although the above spectral data points to a new model that must be taken at face value from the incontestable spectral data, the following deductions arise from theoretical applications of this new model which may or may not be proven with further research, but are important to a complete model.

3.1 Deduction of Electron Transitions under this new model

The spectrum described in this research shows that electrons all reside in spherical shells within the nodes of a nucleon wave. We see how Bohr concluded that there were quantum jumps as the proton-wave only allows certain transitions for the electron. We should however consider how the energy of the proton-wave can remain stable while the energy of the electron loses and gains energy.

Max Planck had a stroke of genius when he pictured oscillators on the surface of a body[17]. Einstein used this description of oscillators in 1905[18]. As we know, Planck and Einstein were describing subatomic particles as oscillators. Particles radiate at the oscillation frequency according to classical mechanics. The electron-particle in the node oscillates at the frequency that it transitioned to the node. It does not radiate the energy that it is holding in its electron-wave while oscillating in the node, however, this does not break the laws of electrodynamics as the proton-wave reflects the energy back to the electron under the Second Law of Thermodynamics i.e. that energy is not transferred from low energy systems to high energy systems. The proton-wave with its high energy can be described as a system of high energy where the energy is equivalent to the mass it surrounds. The electron-wave always contains lesser energy than the proton-wave. Thus, the electron-particle retains its energy as a frequency of kinetic energy i.e. oscillation.

We can even assume that the electron does not need to be immobile in its shell, but can vibrate and change position in the shell without radiating by a second mechanism other than under the Second Law of Thermodynamics. The reason the electron does not radiate as it vibrates in a single node is that the energy of the oscillation shoots off the electron and collides with the proton-wave and then the proton-wave deflects the energy back to the electron-wave. And the electron-particle absorbs the energy and oscillates and has kinetic energy so it collides with the proton-wave which deflects the energy back to the electron-wave so the oscillation continues in a reversible cycle. This creates continuous oscillation without radiation while the electron resides within a node. We can see from the spectrum that the proton-wave does not readily absorb energy because the energy of the antinodes is the same across all series, so that it is reasonable that the proton would return the energy to the electron. The reason that the proton-wave does not absorb the energy of the electron-wave is due to the Second Law of Thermodynamics in that heat i.e. energy moves from a more excited system to a less excited or cooler system. The proton-wave has an energy proportionate to its mass. The electron-wave has an energy proportionate to its mass. Excess energy in the electron-wave does not readily transfer to the larger energy system of the proton-wave. Therefore, the electron-wave must transfer the energy to other electrons that have less energy in their electron-waves. If an electron-wave is not in contact with another electron-wave of lesser energy and the electron is holding a full quantum of energy, the electron-wave must radiate the energy as light. (We note that the proton-wave may absorb energy and radiate as is known to happen in particle accelerators[19]. Proton-wave absorption will be treated later.)

When the electron absorbs energy from the environment, the electron-wave absorbs the light, and the particle oscillates at the new frequency as shown in the tables above. We deviate from current theory in that in this new model all oscillations without emission or absorption occur in a reversible cycle between the electron-wave and proton-wave.

First let's treat the electron as if it gains or loses energy before the transition. An electron with energy E is oscillating with frequency v in node $\boldsymbol{a}$ which is a node other than ground states equal to zero excess energy, and has kinetic energy $\boldsymbol{v_{kin}}$ where $\boldsymbol{v_{kin} = E}$. After it loses or gains energy, the electron now has energy $\boldsymbol{E_1 = b}$ where $\boldsymbol{b}$ is the energy of the adjoining antinode. The electron then transitions through antinode $\boldsymbol{b}$ and while inside antinode $\boldsymbol{b}$, it has potential energy $\boldsymbol{v_{pot}}$, because the energy is stored in the electron-wave while transitioning.

$$\boldsymbol{v_{kin}(E_1 a) = v_{pot}(E_1 b)}$$

After the energy loss or gain, the motion through the antinode does not change the electron energy, therefore, there is no absorption or emission of radiation while the electron is moving through the antinode having lost the energy to overcome the Coulomb force of the nucleus or gained enough energy to overcome the Coulomb force to an outer shell. After emerging from the antinode, the electron oscillates at the energy that it initially had plus the energy that it lost or gained before transition. When the electron is oscillating in the node, it is in a reversible cycle with the proton-wave $\boldsymbol{P}$ due to the Law of Atomic Equilibrium explained below. The kinetic energy of the electron transfers to the proton-wave and then is transferred back to the electron from the proton-wave.

$$\boldsymbol{v_{kin}(E_1 a) \rightarrow v_{pot}(P) \rightarrow v_{kin}(E_1 a)}$$

The preceding relation may not be a precise statement, since the potential energy may not be absorbed by the proton-wave but may only be deflected by it, since the proton-wave maintains its antinode energy despite the energy of the electron. The reversible cycle may be a perfect deflection of energy where there is no transfer of energy to the proton-wave, such that, the kinetic energy of the electron is deflected back from the proton-wave to potential energy in the electron-wave, such that the electron changes the potential energy to kinetic energy in a reversible cycle.

$$\boldsymbol{v_{kin}(E_1 a) \rightarrow v_{pot}(E_1 a) \rightarrow v_{kin}(E_1 a)}$$

If while the electron is oscillating in an outer node, instead of a deflection, the proton-wave is causing the electron to create a reflection, then the oscillation has reflective symmetry and no energy is ever transferred from the electron to the proton-wave.

Also, the current model explains that the electron can only transition outward and inward to its ground state which is described as n=1, n=2, etc. These whole numbers represent the consecutive spheres in space where the nodes occur. Under this new model described by the spectrum, the electron is restricted by the antinodes of the proton-wave. Therefore in zero ground state atoms when the electron is in ground state, the electron mass to electron-wave energy is in natural state equilibrium i.e. there is no excess energy in the electron-wave so that the excess energy in the electron-wave is equal to zero. Therefore, when energy is absorbed to transition from ground state, the electron is only allowed to transition to the nodes described by the surrounding antinodes. For instance, there are two antinodes on either side of the electron in Balmer ground state. There is the 10.2 eV inner antinode or the 1.89eV outer antinode. If the electron gains 10.2 eV of energy, it may transition either to Lyman ground state, or it may transition outward through several antinodes. This is when the Coulomb force between the proton and electron makes the inward transition more likely, then the electron is more likely to transition to Lyman ground. This means that the electron has 10.2 eV in Lyman ground state when it transitions inward toward the proton. Therefore, a Lyman electron has more energy than the other series as it takes more energy to transition to the Lyman series. Once in Lyman ground state, the electron is holding too much energy for ground state and must transition back out through the 10.2 eV antinode again, because it has 10.2 eV of energy. The electron did not lose the 10.2 eV of energy in the transition to Lyman ground state and so it oscillates back outward as it cannot stay in Lyman ground state because it has enough energy to penetrate the outer antinode. Later, when it emits the 10.2 eV as radiated light, it falls back into ground state at zero energy. To transition outward again, it must gain energy. To recap the transition, a Balmer ground state electron absorbs 10.2 eV, transitions inward through 10.2 eV antinode. Transitions outward with no emission or absorption through the 10.2 eV antinode. Then later may emit 10.2 eV and transition back to Lyman ground state where it will have zero kinetic energy. No particle ever has zero energy because each particle has a standing partial quanta wave of energy. That wave holds the particle together and if that wave is gone, the particle does not exist.

The change to the atomic model under Sollism Theory is so fundamental that it is worth restating known phenomena. Therefore, whether an electron transitions outward or inward depends on the overall state of the system of atoms. If all atoms of a local system are in a state of increasing energy, the electron absorbs energy as the system gains energy or heats up. As the system cools, the electron emits energy. Similarly, an electron in an atom that is surrounded by less energetic atoms will emit energy, and an electron in an atom that is surrounded by more energetic atoms will absorb energy. This is in accordance with the known laws of thermodynamics. Atoms behave in accordance with universal laws.

Under Sollism theory, the electron may oscillate in a node without losing energy or radiating due to the proton-wave in which the electron resides. An anomaly in our current science is that we have no explanation for the continuous background radiation of the emission spectrum. If all light comes from electrons radiating at discrete frequencies, where does the rest of the light come from? The current model does not explain how we can see the absorption spectrum. Without the continuous spectrum, the entire sky would be Fraunhofer lines or missing colors, meaning how could the sun produce all colors in the rainbow? We all acknowledge that lead atoms absorb x-rays of .01 to 10nm wavelength so that lead is a good radiation barrier, but the atomic spectrum of the element lead is absorbing wavelengths in the range of 106 to 1049nm[20]. So we should try to build a model that will allow for a continuous spectrum and not disrupt the atomic spectra of elements. We begin with the assumption that all particles are surrounded by standing waves and that the standing wave absorbs and emits the energy.

We know through Compton Scattering that an electron is able to absorb a portion of a gamma ray and ionize and can thereafter be described as a free electron resulting in an "increase in the wavelength of the scattered beam"[21].

The absorption spectrum of light is viewed across a continuous spectrum. Where Ek is the kinetic energy of the electron, meaning the frequency of oscillation of the electron, where E is any form of energy or amount of energy and Ex is excessive energy gain than required for a full transition to an allowed spectral node, then in the case of light absorbed where λ is the wave length so that λE is a wavelength of any energy:

$$Ek + \lambda E =+ \lambda(Ek) - \lambda(Ex)$$

For each different amount of light energy absorbed (absorption shown by the + sign), the amount of -Ex (excess energy) is not absorbed but scattered back into the spectrum of continuous light. Wavelength λ absorbed takes a discrete value corresponding to the node of the vibrational energy state of an allowable electron transition (up to its ionization energy such as in Compton scattering, but much of the environmental energy will not be gamma radiation) so that the absorption spectrum remains discrete. And Ex takes any value depending upon the original frequency of light impacting the electron less than the energy absorbed by the electron for an allowed transition. This excess energy is scattered and creates the continuous spectrum, in which, only the amount needed for a full quantum has been absorbed. This does not interfere with our perception of the absorption spectrum. And Ex takes infinite values depending upon the incident light impacting the electron. Therefore, the electron can utilize any amount of incident energy present in the environment. Therefore, a star that contains mostly hydrogen can radiate a continuous spectrum of light.

Only the amount of energy for one transition to an allowed node is absorbed from any amount of energy and the remaining energy is scattered. When the incident light is of an energy exactly described by the energy of the electron transition, then the absorption is equal to Ek, then there is no scattering but complete absorption as in the current model.

The excess scattered light will be of a different frequency because it was only partially absorbed. This scattered excess light will not interfere with the absorption spectrum, because it is not the frequency of the absorbed light.

The spectral lines represent the majority of transitions taking place in many millions of atoms as a system, so this would not disrupt the spectrum. The continuous background of the spectrum tells us that most radiation is random, not discrete. And most allowable electron transitions are not happening often enough to create spectral lines. Only the most traversed antinodes create spectral lines and this mostly occurs in or near the ground state lines. This does not mean other transitions are not happening, but the other transitions do not happen frequently enough to create an intensity of emission or a noticeable absorption. In the same way, other non-discrete emissions and absorptions are happening and these are so random and at such a variety of wavelengths as to not create emission or absorption lines. However, the proton-wave restricts the allowable energies for transitions causing the electrons to fall into a pattern of absorption and emission that when multiplied by the atoms in the system create the atomic spectrum.

The emission spectrum is equal to the absorption spectrum, because the proton-wave antinodes restrict the absorption of the electron to the energy necessary to transition through the antinodes. Because the absorption spectrum causes the electron to have discrete amounts of energy when the electron is in an excited state, then when the electron loses the energy to return to ground state zero, it can only lose the energy that it has gained, and it has to lose enough energy to penetrate through the next energy antinode and can lose no further energy until it can transition through a lower energy antinode, so that the emission spectrum is discrete automatically.

3.2 Zeeman and Stark Effect

Despite the spectra showing that the proton-wave maintains consistent energy in its antinodes, we know from the Zeeman[22] and Stark[23] effect that the proton-wave can be seen to be in different energy states between different atoms of the same element.

Under this new model of the atom, this is caused when the proton-wave is gaining energy by the proton transitioning in other proton-waves. The proton-wave for the same element can have a larger atom due to energy absorption. The proton-wave energy absorption causes some proton-waves to have an overall expansion, thus shifting the spectral lines creating a spectrum where some nodes and antinodes of the proton-wave in some atoms are expanded thereby showing a fine structure line, while other proton-waves in other atoms show the normal spectral line. We always view the spectrum of, at least, many millions of atoms. Where either energy or magnetism is affecting some atoms and not others, the fine structure line will appear in some atoms and not in others. One line will appear in the normal position in some atoms. The expanded proton-wave line will appear as one line in other atoms that have more energy in their proton-wave. The overall effect is to lessen the intensity of the normal spectral line and increase the intensity of the fine structure line depending upon the number of atoms affected by electromagnetism which causes a response in energy variations of the atomic proton-wave.

Therefore, the cause of the Zeeman and Stark effect are that the protons themselves sit in each other's waves. As the proton-wave is infinite according to the Balmer-Rydberg formula, this must be so. The protons appear to have discrete energy levels when they move in Nuclear Magnetic Resonance (NMR)[24]. Since the proton-wave appears stable in Hydrogen I because it is sustaining antinodes of determined energy levels, and does not change with the energy levels Lyman, Balmer, etc. series of the electron, the proton must be transitioning through the proton-wave of an adjoining proton to cause fine structure. Hydrogen is diatomic and therefore a pair of Hydrogen atoms sit closely in each other's proton-waves. When magnetism pulls the protons from each other, it causes them to shift in their mutual positions of overlapping proton-waves. The protons themselves would sit in nodes surrounded by the weaker energy antinodes of their mutual proton- waves than those that the electrons sit in. So a shift would cause only a slight energy difference in the infrared. When the proton is sitting in the proton-wave of another proton, where the source of magnetism moves the respective protons further apart from each other, one proton will shift in the other proton's wave. Where the proton sits in the proton-wave of another proton will depend on the chemistry of the molecule. If protons are oriented in the same environment and chemically equivalent, the transition levels will be the same. So the signal will be the same for all transitions that are equally spaced from each other, because they will sit in the same nodes of their respective protons.

Take the Balmer series. A shift of the proton A sitting in proton B's wave where proton A was sitting in the node described in the Balmer equation by substituting 90 and 91 for the lines between the energy, we get:

Balmer Lines	energy in eV	m Balmer Equation
364.7401186	3.39925395	90
364.7361798	3.39929066	91
Difference	0.000036710	Antinode

If the proton shifted through this antinode by magnetism, the values of the Hydrogen atoms that had shifted would show a .000036 eV shift in their frequency while other protons not receiving enough energy to shift in their proton-waves would not change the electron frequency of their atoms. Therefore, the overall effect in the spectrum would be less intensity in the normal frequency of the node and more intensity with more electrons experiencing the shift in the proton-waves as a .000036 eV shift in frequency.

We can see this effect at the 656.27248nm line of Hydrogen when it has fine structure equal to 656.28518nm. However, this is probably oversimplified and the transition is of higher energy and distributed across the entire proton-wave.

Because each proton sits in the standing wave of other protons, a portion of the energy of the weaker outer antinodes of the partial quantum standing wave of the protons are encircling other protons in molecules. In other words, the two Hydrogen atoms making up diatomic Hydrogen are sitting in each other's standing wave, therefore, the two separate atoms are encircled by a portion of each other's outer standing waves which creates energy exterior to and encircling both atoms. Since the proton-wave extends its energy to an infinite extent, all protons sit in each other's proton-waves. This describes partially superimposed spheres of energy binding protons in molecules. This explains Van Der Waal forces[25].

So, in this model of the atom, the fine structure lines can be traced to an off-set of the proton-wave caused by a proton transition enlarging some atoms as in the Helium I shown in Table 10 above where the two proton-waves in the nucleus are slightly offset from one another.

3.3 Heat

Let's imagine an electron being fired at Hydrogen from a LEED gun infinitely far away from the atom at 5 eV. If the electron impacts the Hydrogen ion, the electron will seek a level of ground state. It will pass through antinodes emitting as it approaches ground state, but it cannot come to rest in the 10.2 eV Lyman ground state because it does not have enough energy to transition through all the antinodes to Lyman ground state. So the 5 eV electron must come to rest in Balmer ground state. To arrive at Balmer ground state, the electron will have emitted 3.4 eV of energy as it passed all the antinodes to arrive at Balmer ground state because all antinodes to Lyman state are 13.6 and subtract the 10.2 Lyman antinode and you have 3.4 eV energy of all the antinodes to Balmer ground state. The electron will have 1.6 eV of energy in Balmer ground state, but it cannot transition through the 1.89 eV antinode so it must lose 1.6 eV of energy without radiating 1.6 eV of light which is not a full quantum and come to rest in Balmer ground state. We must stand by the fact that non-full quantum light is not radiated, so we have to ask what happens to the excess energy since ground state must be zero in Neutral Hydrogen. We have seen that partial quanta may form a standing wave if that partial quanta is surrounding a particle. However, as we know from the spectrum of the proton in Neutral Hydrogen, the proton-wave has a strong tendency to maintain its energy as the antinodes do not change with changes in the energy of the electron.

In this case, the excess energy in the above scenario cannot be radiated. We know that heat travels in two ways: one is through radiation at the speed of light in full quanta, and the other is through contact by convection and conduction at less than light speed. We can see now that we can account for excess energy in the electron-wave that is not radiated, through the definition of heat by convection and conduction as contact energy transfer of electron-waves that release partial quantum energy. When the energy is less than E_k i.e. the exact kinetic energy necessary for the node of the proton-wave which energy is equal to a full quantum, it is partial quanta energy and is transferred through contact with particle-waves as heat. In this way, we allow for atomic emission of excess energy that does not interfere with the radiation spectrum of light as there is no radiation absorption or emission, but a flow of heat energy by contact. Because both convection and conduction do not travel at light speed, they cannot be radiated light. Because the standing partial quantum wave around particles is energy that does not travel at light speed, we can imagine other energy that does not travel at light speed. An electron can oscillate a full quantum and produce radiated light, or an electron can pass energy by electron-wave contact and transfer heat.

The electron can convert energy of heat, electricity, and light, by absorbing a quantum from either, the full quantum and re-emitting it with the frequency of its oscillation in the node, or transferring excess partial quantum energy by electron-wave contact. Heat is partial quanta contact energy. Kinetic energy is the particles manner of showing it contains excess energy. The particle oscillates when it contains excess energy in its wave. However, the oscillation does not contain the energy, but is a byproduct of the fact that excess energy is present. The energy is this wave energy. Wave energy is measured here in electron volts and causes a particle to oscillate at the voltage of excess energy that the particle holds in its wave.

We infer that the electron wave is storing the energy for its transitions through the proton-wave as the spectrum tells us that the proton-wave stays the same energy. However, from studying a free electron in a vacuum tube, we infer that the electron tends to radiate excess energy at multiple frequencies when it is not close to the proton, so when the electron is outside of the higher energy proton-wave antinodes, the electron freely releases energy to tend to its natural electron-wave lowest energy state. These releases of energy are still discrete but not as distinguishable as when the electron is in the higher antinodes of the proton-wave. In the same way, an electron in a cloud chamber appears to be moving continuously, but it is moving on the lower energy antinodes of the proton.

Thus energy is released from an atom in only certain quanta due to a physical reason. Under the Law of Atomic Equilibrium, a particle must retain its energy field to mass ratio to remain stable and cannot emit energy in excess of this ratio. Any emission of energy greater than the energy needed for the node is reflected back from the proton energy wave and given back to the particle.

An electron in the Lyman series may gain 10.20 eV of energy and transition, then gain another 1.89eV of energy and transition. This line would appear to be in the Balmer series, but the electron would be in the Lyman excitation state. The electron would emit a Lyman line when the electron fell back to ground state.

Another scenario would be an elastic collision of an electron from a LEED gun. Let's imagine an electron fired at 50 eV from a LEED gun at a Hydrogen ion atom from an infinite distance. The electron would lose 13.6 eV of energy as it approached Lyman ground state, but as it still retains 36.4 eV of energy, it will have an elastic collision with the proton-wave and ionize back out gaining 13.6 eV of energy so that the energy is again 50 eV after the collision.

It is given that the laws of conservation of energy and matter exist in the atom. We will assume that an equilibrium exists between a proton's mass and its energy in its particle wave. We can infer that the proton particle and proton-wave tend to preserve an energy to mass ratio. The mass of a proton particle is generally fixed and the energy of the proton-wave is generally fixed in the spectrum. We infer that the wave of every particle can store energy, but that its natural ground state is the amount of energy to mass ratio that keeps the particle stable described by **e=m**. The Law of Atomic Equilibrium is that all particles tend to natural ground state of their energy wave to particle mass ratio. The Law of Energy is that unradiated energy tends to accumulate in a spherical shape of coherent standing waves in space that creates particles. The universe naturally clumps energy around particles. Where **p** is a particle**: p = m + e**, or **m + e = 1**. Unbroken (in latin: Sollus).

Electrical current is full quanta light energy that travels by electron-wave contact. Electrical current is contact-energy. Heat energy is partial quanta energy that travels through contact of the electron-waves. Radiation of heat and radiation of light are both the same thing, that is, they are full quanta energy that is radiated at the speed of light i.e. they are both light and what Max Planck discovered is exactly what Einstein discovered, in that, heat radiation is light radiation. In heat, the electron releases excess energy in two separate processes. It releases full quanta as light and it releases partial quanta as slow-speed contact energy. The energy is the same, but released in two forms.

If all electron-waves in an atom are aligned so that they are all in contact and all electron-waves of their respective molecules are aligned so that they are in contact, electricity or electrical current can flow freely without resistance as in a superconductor. When all electron-waves are not in contact, the electrical current flows by electron-wave contact and the more irregular the path of contact, the more resistance. When the energy of heat or electricity are equal to the frequency of the vibrating electron in its node, the electron converts the heat or electricity to full quanta light radiation corresponding to the electron's frequency. The radiation of light from heat and the radiation of light from electricity are the same energy being released in the same way by electrons are full quanta light radiation. Therefore, the light from heat radiation, electrical radiation in a light bulb, and radiation from the sun are indistinguishable. Of course, we can manipulate the frequency, but it is the same full quanta energy that originated as excess energy in the energy wave of a particle.

The partial quanta waves belonging to particles have zero velocity relative to their particle. And the wave-particle energy-mass relation is stable around protons and electrons. Because of this protons and electrons are long-lived particles. Energy holds matter together. All mass is surrounded by energy. For these two particles i.e. the proton and electron, there is no associated velocity for the particle-waves. This appears to be a universal law of the atom—a law of equilibrium **e - m = 0**. On the other hand, not all partial quanta waves form around particles in a stable energy to mass relation which creates particles with short half-lives. Where partial quanta energy is absorbed in the particle-wave in excess of **e=m**, the partial quanta can move through contact in the form of heat. Where **e - m > 0**, work is done i.e. energy transfer.

The Universal Law of Equilibrium says that every stable particle resists changes to its particle-mass to energy-wave ratio. For every stable particle, the ratio of particle-mass to energy-wave is equal. Conversely, for every unstable particle, the ratio of particle-mass to energy-wave is an inequality. When **e=m**, the particle is stable.

Potential energy is the measure of excess energy above natural equilibrium state that is stored in the electron-waves, proton-waves, and neutron-waves of the atoms describing the mass that has potential energy.

It should be noted that this does not interfere with the laws of the statistical mechanics of Maxwell, Bozeman, et al. The reason is that an increase in energy stored in the particle causes the particle to vibrate at a higher frequency so this automatically increases the kinetic energy of the system. This never destroys the absorption or emission spectrum as this contact energy is always less than needed for an allowed transition so there is no light radiation or light absorption by partial quantum excess energy transferred through electron-wave contact.

3.4 Electricity

This model of the atom can describe the cause of electricity thus: The Zeeman and Stark Effect are the transition of protons which cause electricity i.e. magnetic changes cause electricity. In induction of electricity, a non-neutral charge pulls on the protons in matter. The protons must shift through the antinodes of other protons. When the proton-particles shift, the proton-waves must absorb energy to shift through the antinode. The proton-wave absorbs energy from the environment in the amount necessary for transition through the proton-wave. This, however, is not the ground state for the proton. When the magnetic force is no longer applied to the proton-particle, it emits the energy gained and shifts back to its ground state. This energy emission is in the form of full quantum energy that is emitted through electron-wave contact.

Protons have proton-waves that extend to infinity as is deduced above from the Balmer-Rydberg equation. The problem of the proton-waves exchanging energy is that the web of infinite proton-waves would cause energy transfer without resistance if energy flowed through the proton-waves. However, this is solved if energy is transferred through the electron-waves. Therefore, the excess energy in the proton-wave can be passed to the electron-waves, because the electron-waves are systems of lower energy than the proton-waves.

So proton-waves shift toward the opposite magnetic pole of the source charge. This causes the proton-wave to gain energy in the amount of the antinode or antinodes that the proton is forced to transition through. This causes the antinodes of the proton-wave to enlarge. This causes the electrons to appear to transition at slightly different antinode levels causing fine structure.

Protons can emit excess energy through light radiation in a particle accelerator. Electron-waves are most likely finite as seen from the fact that there is resistance to electrical current meaning that electron-waves are not always in contact with other electron-waves. And heat and current only flows when atoms are close enough together that the electron-waves are in contact. Therefore, the electron-waves must not always be in contact. The electron-wave is finite.

The proton must release the excess energy that was absorbed by the forced transition by magnetism. For protons, as with electrons, the ground state is defined by the element and its molecular structure. When protons are in the state of matter defined as a solid, the protons and electrons are so closely bound that radiating full quanta as light is constantly reabsorbed by near electrons. Electricity could be thought of as tiny increments of light radiation and absorption in a solid, but it is more likely that the energy emitted when the proton transitions back to ground state is released to the electrons that reside in the proton-wave. These electrons then release the energy through electron contact.

We know that protons as well as electrons are shifted by a magnetic force. Therefore, electrons are also transitioned to a higher energy state by the magnet and when the magnetic force is removed the electrons also settle back down to ground state releasing their energy.

We know that lightning has a different form than sunlight. Therefore, energy is not being emitted in lightning or sparks as pure radiated light. The current of electricity that we see is rather energy that has not been radiated by the electron, but is transferred by electron-wave contact by contact transference of energy.

The proton transitions through the antinode of another proton. The antinode is of a particular energy as is shown in the spectrum. In order to transition through an antinode, the proton must absorb energy from the environment even if the proton is being forced through the antinode by magnetism. Therefore, the energy wave of the proton must gain energy and the proton-wave antinodes increase in energy. Therefore, the electron transitioning in the proton-wave will have different transition energies as the proton has more energy in its proton-wave. The protons sit in the lower antinodes of other protons so the transition energies are in the infrared as is known from Nuclear Magnetic Resonance (NMR). When the magnet is taken away or fluxes away from the proton, the proton-particle returns to ground state and its proton-wave emits the excess energy to the electron which releases it through contact with other electron-waves.

A magnet pulls the proton to a different node. Electrical energy is pulled from the energy in the surrounding environment. Protons are forced to transition. They absorb energy from the environment. The proton-wave engorges by the amount of energy of the antinode of proton transition. This changes the electron transition lines slightly in the affected atoms. The magnet is taken away. The protons transition to ground state and emit energy in the form of non-radiated contact transference. As long as the magnet continues to return to pull the proton from ground state to a higher energy level, the electrical current continues as long as there is a magnetic flux.

It may appear in experiment that electrons cause the flow of electricity, but electrons flow through a cathode ray tube in order to try to correct the imbalance of charge. The spectrum tells us it is the Stark and Zeeman Effect or the magnetic effect that causes electricity. That effect is related to the transition of the protons as is seen in the spectrum where the lines are shifted to the extent of the proton transitions.

In a super conductor, the material must be cold so that the electrons move to lower ground states of less energy away from the nucleus and the atoms become enlarged. The electron-waves then can all become in contact with each other and the "contact light" that is electricity can flow freely.

Induction can be illustrated by dragging a finger across a keyboard and observing the hammers lift inside the piano. In the same way, a magnet pulls apart the protons and electrons shifting them to higher more energetic nodes. Energy must be absorbed during the transitions of protons and electrons through the antinodes in an equal amount to the antinode energy. In induction, a magnet is like the finger dragged across the keyboard lifting the particles to higher states of energy. As the magnet moves away, the particles drop down to lower energy states and release the energy as contact-energy electrical current.

The Maxwell equations describe the radiation of full quantum light. However, there are two fields. One describes radiated full quantum light and one describes the proton-wave radiating through space. The magnetic lines of force existing around bodies are the weaker antinodes of the proton-waves appearing around matter in a substance where the radius of the magnetic poles in the matter is greater than in neutral matter causing a magnetic imbalance such that it distorts the proton-waves. We see that just as the proton-wave becomes coherent around the nucleus, the lower antinodes extending beyond matter become coherent around matter.

3.5 Light

The photon of a radiating electromagnetic wave—light—is best understood as a cycle of a propagating or traveling standing wave with nodes and antinodes where one full cycle is described from node to node. A full quantum is a full photon which is described by one full cycle so that eʎ=hc meaning one wavelength represents one photon. It can readily be seen that this describes light as a radiating wave that behaves as a particle. This describes a model that more closely resembles the observed phenomena and in a simple way unites the wave theory of light with the photon particle theory of electromagnetic waves. Although contrary to current particle physics theory, this also correlates nicely with the above atomic theory of particles being surrounded by standing waves of energy.

Michael Faraday taught us that light can be affected by magnetism[26]. Faraday's polarization experiment is pictured in Figure 1.

Polarization of light. A bar magnet perpendicular to the light wave has no effect. Poles presenting parallel to the light wave temporarily move the dual charges of the photon.

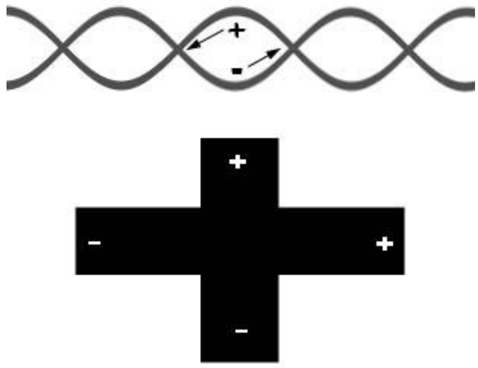

Figure 1. Picturing the polarization of light in the Faraday experiment.

In Faraday's experiment, the polarization of light caused by the mirror created a plane of charge perpendicular to the direction the light was traveling so that a magnet attracting the light from a perpendicular direction had no effect on the polarization. However, a magnet attracting the charges away from the perpendicular re-polarized the plane of charges in the light to an orientation parallel to the direction of the light. In this alternative view, the EM waves could have charge although the charge would have to always be in a neutral configuration.

The propagation of light in Maxwell's equations describe an electromagnetic field based on the inverse square law. The Maxwell equations are automatically quantized by the inverse square law which describes spheres in space similar to the proton-wave pattern. The quantized energy is between the spheres of the traveling standing wave of EM radiation. Where the radius describes lengths equal to the wavelengths of electromagnetic waves, the spheres describe the nodes and the difference between spheres describes the energy of the wave. In this way, Planck's constant is inherent in Maxwell's equations. Where the unit for r is the wavelength of light, the difference between wavelengths represents the energy of the light. This applies both to electric current and radiated light that both travel at the speed c.

In the neutral atom, the proton's partial quantum light energy of the standing wave behaves like the Neutral Hydrogen atom and each proton-wave of the nucleus is polarized by the electron so that one proton-wave attracts one electron-particle. Or more precisely, each electron attracts the positive poles of a single proton standing wave. In single electron atoms, the light of each proton standing wave becomes polarized so that all the electric poles of the light are aligned so that the positive poles of the light are attracted to the negative electron and the standing wave becomes coherent.

Radiated full quantum light therefore is a traveling standing wave with each photon describing dipoles in its electric field which field is perpendicular to its magnetic field. Each spherical photon contains multitudinous charges which split with distance from the source. In a single wave of radiated light, the dipole of one photon is transposed with respect to the adjoining photon as like charges repel and unlike attract so that light has a neutral charge. Michael Faraday's experiment showed that a magnet can temporarily rotate the poles of the photon to align in the same direction. This phenomenon describes what is happening in the single electron atom.

As the two charges of the photon spread across space in either a radiated light wave or a partial quantum standing particle-wave, the charges lose energy as described by the inverse square law. This can be understood as the charges splitting or dividing over space with distance such that the overall charge remains neutral and the charge weakens with distance.

In quantum entanglement, a photon spherical wave is split between unlike charges.

The mathematical formula for all atoms may thereby be described by how the number of electrons rotates the magnetic poles of the antinodes of the proton standing waves that make up the nucleus.

To visualize how the electrons are traveling on different polarized proton-wave configurations in the same atom, we may take James Clerk Maxwell literally that the electric field is linear and described as a plane and the magnetic field is rotating around the plane which is "plane-polarized light."[27] So by defining radiated light by Maxwell's wave theory and Einstein's particle theory, we get a traveling wave that has the configuration of a standing wave, that is, it has nodes and antinodes and the energy is carried between the nodes. Therefore, if the electric field is a plane within the antinodes of the proton-wave and the magnetic field is not another plane, but fills the space above and below the electric plane, then we can picture the electrons polarizing the plane to themselves. In this way, the electrons in the same atom could travel across proton-waves of different magnitudes of energy.

In Bose-Einstein Condensate, we see the coherent waves of the atom shown in phase[28]. Also, we can see how a super atom forms, because the colder an atom becomes, the further out its electrons transition from the proton as Sollism Theory predicts many ground states per element. The spectrum is caused by introducing heat or light energy into the element and most of the spectral lines are in the higher ground states. However, a true Hydrogen ground state near absolute zero would be very far from the Lyman series ultraviolet ground state. The lesser energy antinodes reside further away from the nucleus and each has its own ground state. As the electrons lose energy, the atom becomes larger as the electrons move to lower and lower ground states.

Quantum entanglement is the result of the wave nature of photons in a traveling standing wave. The wave front could be split, but continue to have the properties of the wave.

4. Discussion

I realize that this is a Copernican wrench into a 100-year old system that has been refined, but the spectral evidence appears to allow no other interpretation than a standing wave of energy surrounding each particle in the nucleus. This model has benefits for a better understanding of electromagnetism, motion, heat, chemistry, biology, and other sciences, as well as clarifying much of the experimental results of the last century. The energy of the proton-wave into infinite space will eventually have repercussions in astronomy and explain dark matter and dark energy. The portion of the proton-wave in the nucleus should eventually explain the nuclear weak force. Because this theory proves that both the macro and micro worlds obey the same laws, it can lead to an Atomic Theory of Gravity which includes Newton's outer inverse squared energy, Einstein's inner relativity energy, and the greater spheres of energy exterior to all matter.

It is my belief that this model of the atom will be a first step in clarifying many of the big questions left unanswered by quantum mechanics. I know many experiments that could be cited that would reinforce this view of the atom, however, there are too many to cite in this first article as the concept here is revolutionary and will be controversial for some time to come. Some of my conclusions may need to be refined, but the basic data from the spectral evidence cannot be controverted. I believe this is the beginning of a new era in atomic theory and that many new equations can be found from examining the spectra from this standpoint. Many mathematical relationships still need to be discovered from this basic data.

The current Quantum model explains that the Hydrogen lines are there because they have to be there although they are contrary to the laws of electrodynamics. However, when we introduce causality, it unifies the universe. Unfortunately, science influences philosophy, and I am fully aware of the philosophical implications, and frankly, I prefer an indeterministic philosophy of the universe with some of its more interesting and fantastical notions, but philosophy cannot dictate science. However, no model of the universe has yet been the underlying reality. The goal of a scientific model is to determine measurement and predict nature, so the model must be deterministic to do this, even if, in reality, the universe is indeterministic. Science is still young. Every theory will eventually be revised and become more precise until one day perhaps thousands of years from now, there will be no more anomalies to explain.

Having said that, let us take one more leap of logic and ask what is being compressed by the energy when a particle is created? The only answer that arises is space. Therefore, we may conclude that the only fundamental things in the universe are energy, space, and charge.

4. Materials and Methods

The majority of the research was done directly from the NIST tables published online.

5. Conclusions

This article is the tip of the iceberg and much more research needs to be done in order to find more accurate equations for atomic behavior based upon this model.

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