The Blueprint for the Atom.

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Abstract:

Just as DNA is the blueprint for the living world, so the Atomic Emission Spectra may be the blueprint for the atom, and the physical universe. In this paper, the published data on Atomic Emission Spectra is analyzed, from first principles. The pattern of spectral energy levels - when electrons fall into the atom - resembles that for a "multi-layered cluster" of electrons in a Potential Energy Well. It contradicts Bohr's atomic model of positive & negative "charges" and fixed electron orbits. This alternative conjecture is that electrons have no charge and simply fill the three-dimensional atomic Potential Energy Well around the protons in the nucleus. The analysis suggests that electrons are much larger than predicted by other present-day conjectures.

1. Introduction:

Simple physics experiments have been conducted over the centuries with numerous theories to explain the observations. Certain theories have become dominant and, in the modern era, these fundamental beliefs generally go unchallenged. This paper re-examines some basic observations in physics, from first principles, and proposes an alternative explanation for the structure of the atom.

Einstein's General Theory of Relativity proposes the distortion of the fabric of space by an object, creating a Potential Energy Well. And the gods have given us plenty of clues to the structure of the atom - in the form of spectral emission energies and ionization energies. This data suggests the atom is a Potential Energy Well having a small nucleus at the center with numerous electrons surrounding the nucleus.

Bohr's conjecture for the atomic structure proposes protons in the nucleus and electrons in fixed orbits. Bohr's peers overlooked the fact that this atom would fly apart if protons and electrons had positive & negative "charge". Similarly, Quantum theory describes the atom in terms of probability functions. But neither theory satisfactorily explains the experimental emission data.

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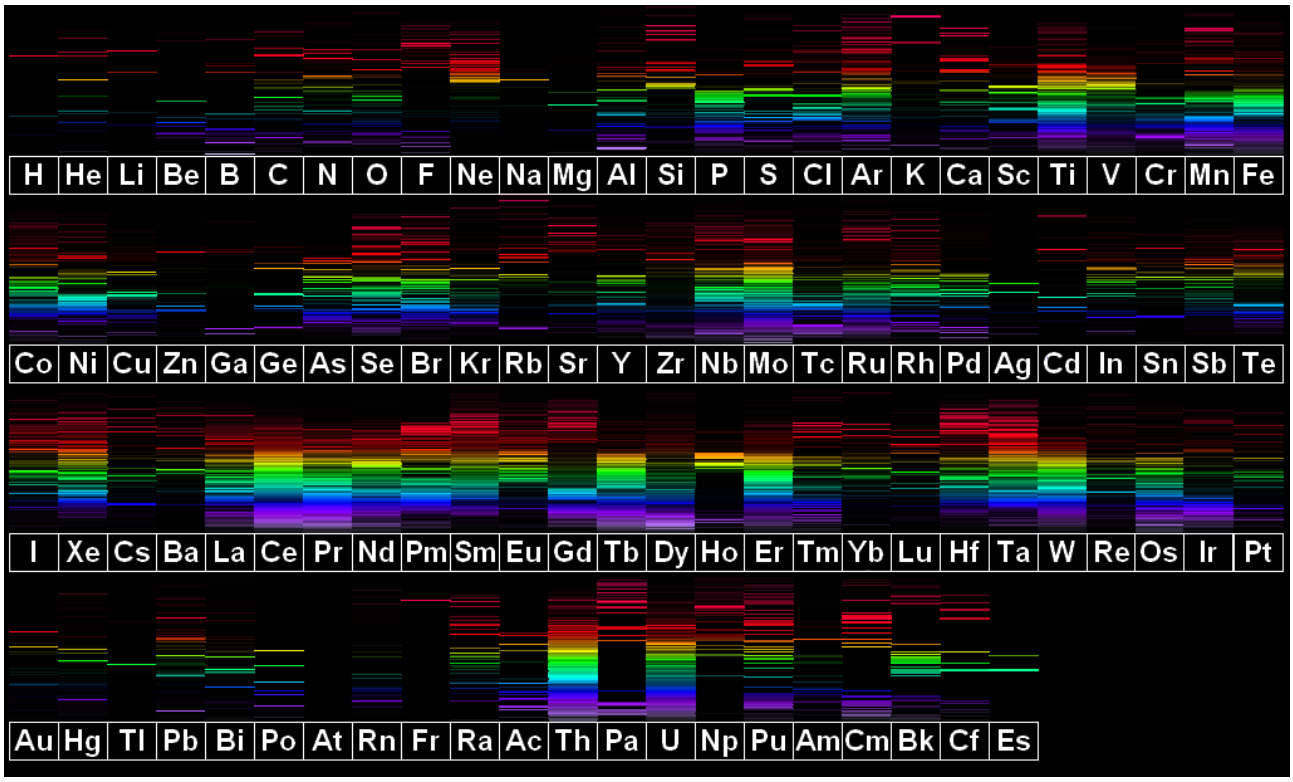
Bohr only saw part of the modern data and, unfortunately, his guesswork has left us with a legacy of misleading rules (most people have been indoctrinated with the theory of positive & negative charges) and unexplained, magical electron orbits.

This paper analyzes the published data on Spectral Emission Energies for the elements. It appears to be the "blueprint for the atom" - see Figure 1.



Credits: NIST data

Figure 1. Spectral emission lines for the elements.

2. Atomic EMISSION Spectra - electrons falling into the atom:

The experimentally observed Atomic Emission Spectra are published in the US by the National Institute of Standards and Technology **[1]**. An example of the Dataset is shown in Annex 1.

The generally accepted understanding is that these spectral emission lines occur when electrons fall into the Potential Energy Well of the atom, collide with another electron or the nucleus, and emit energy in the form of photons. The emission frequency is proportional to the emission energy.

For each element, there are many different spectral energies, with different intensities. The NIST database lists many lines, but there may be even more lines that are of such low intensity that they cannot be observed or measured.

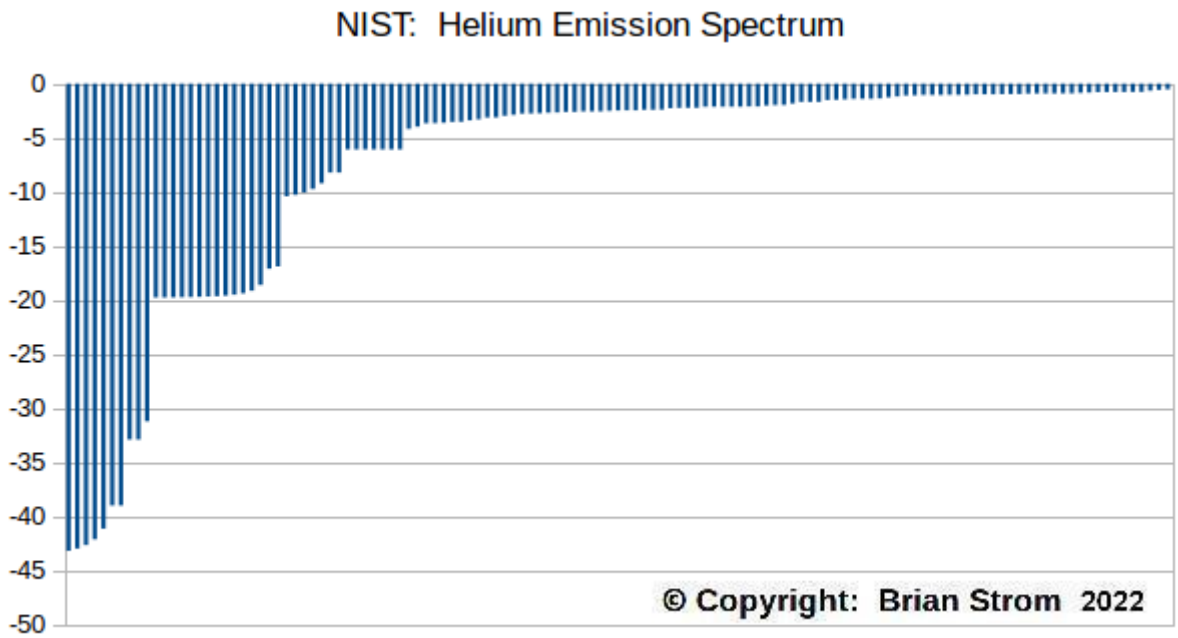


Figure 2. The Helium emission spectrum.

The large number of discrete spectral lines in the NIST database conflicts with Bohr's conjecture for the simple structure of the atom, and is not explained by quantum theory and probability functions.

An earlier paper **[2]** shows the analysis of the Electron Ionization energy levels for different atoms **[3]** – when electrons are ejected from the atom. See Appendix 2.

These two analyses lead to the Brian Strom conjecture that the atomic structure consists of a cluster of electrons filling the Potential Energy Well created by the protons in the atomic nucleus.

Above Absolute Zero, the electrons in the cluster will have kinetic energy (heat) and will be "bubbling", especially those on the outer layers of the cluster.

In this scenario, the number of spectral lines can be expected to be limitless, but of very small energies and intensities.

Figure 3 is a representation of an atom with a tiny nucleus of protons surrounded by a cluster of much larger electrons.

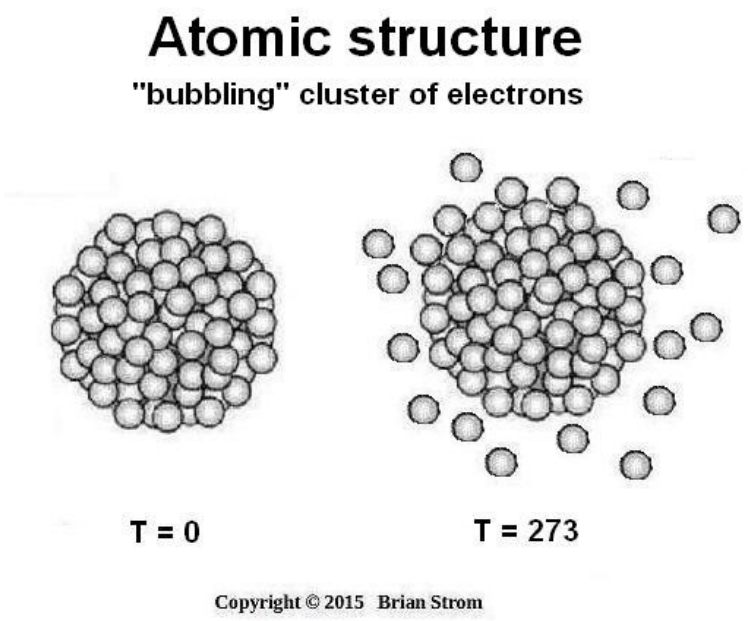


Figure 3. Single atom showing a "bubbling" electron cluster.

The NIST emission spectrum for each element in the periodic table shows a large number of spectral lines. The emission energy profile for each element is similar, but different. The profiles of these elemental spectral lines will be analyzed in detail in a later paper.

The energies of the spectral lines, for all the elements, are shown in condensed form in Figure 4:

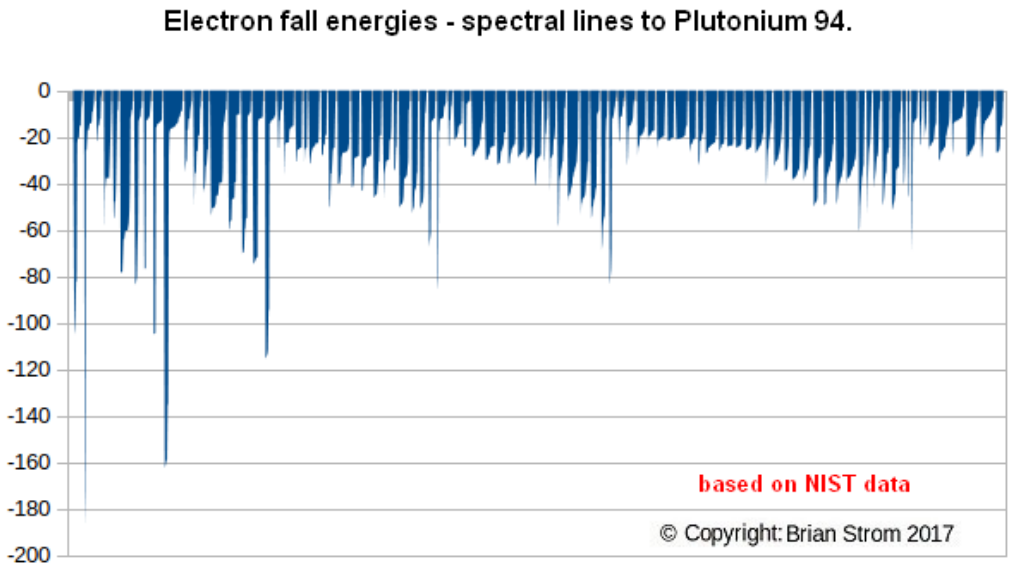


Figure 4. NIST Atomic Emission Spectra: Electron fall energies.

3. Atomic Structure conjecture:

The analysis of the Atomic Emission Spectra and Electron Ionization Potentials leads to the Brian Strom conjecture that the atomic structure consists of a cluster of electrons surrounding the Potential Energy Well of the atomic nucleus.

The discontinuities (step changes) in the values for electron fall energies suggest the atom has a layered structure. As the number of nuclear protons increases, so the size of the Potential Energy Well increases. Hence the number of electron layers increases, and the size of the atom increases.

For a new, additional electron layer, the fall energy of the outer electrons is small. But, as the number of nuclear protons increases, so the electron fall energy increases, pro-rata. See Figure 5:

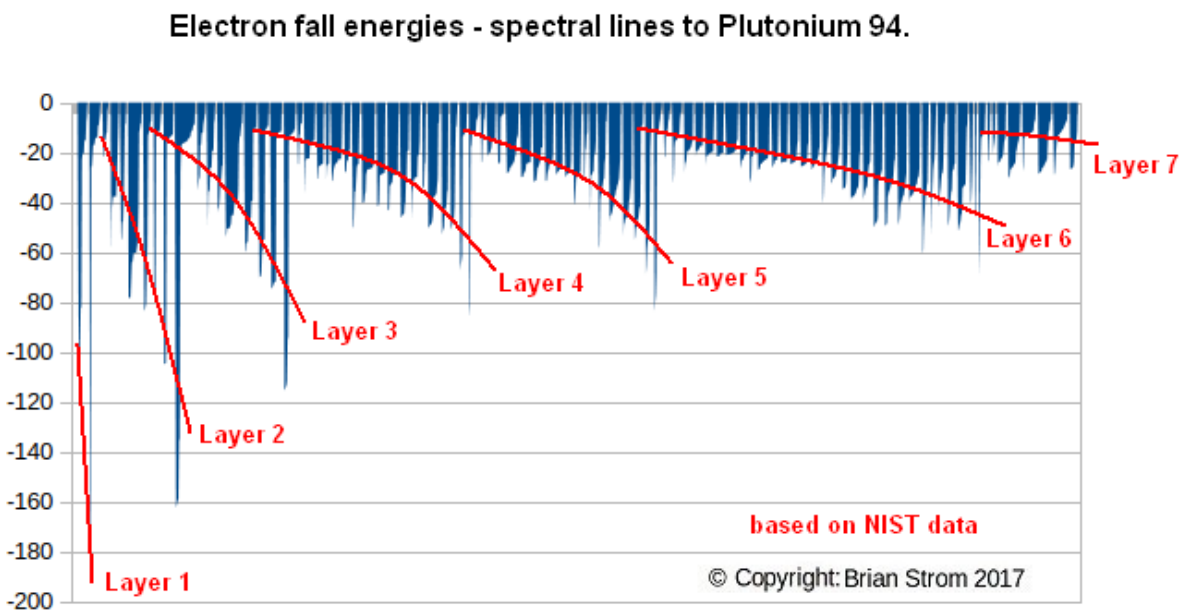


Figure 5. Layers in the Atomic Emission Spectra.

The profile of electron fall energies for the elements mirrors the estimated atomic size of the elements in the Periodic Table. Each additional electron layer results in a larger atom.

For an electron cluster of a given number of layers, the Periodic Table progresses with more protons in the nucleus. So the cluster of electrons becomes more

compressed in the Potential Energy Well. This results in a smaller atomic size along that line of the Periodic Table.

Only when the next electron layer is added is there a step increase in the atomic size.

The profiles indicate that some excited electrons fall back to the outer surface of the atom, and some fall back through one or more layers of electrons, with the emission of higher energy photons.

This can be seen more clearly with a plot of Electron fall energy PER PROTON, where a new electron layer begins at Silicon – see Figure 6:

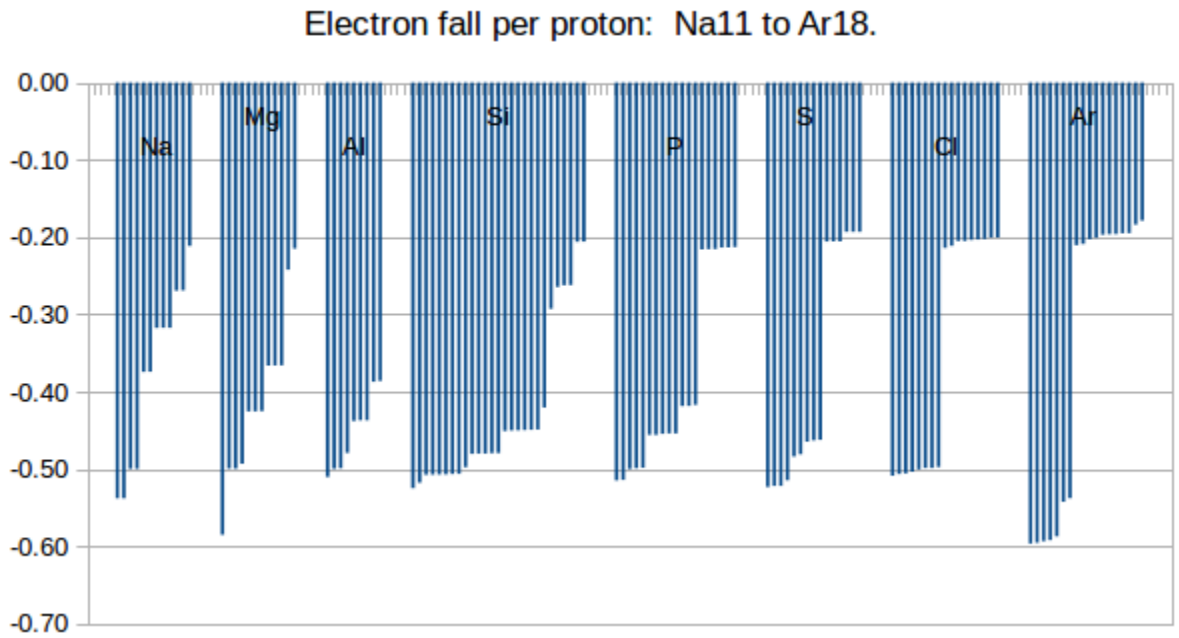


Figure 6. Example of Electron fall energies – PER PROTON.

The electron fall energy profile for the elements follows the 1/r profile of an ever-deeper Potential Energy Well, where the electrons are falling to the outer electron layer, and sometimes through to the next layer in the electron cluster - see Figure 7:

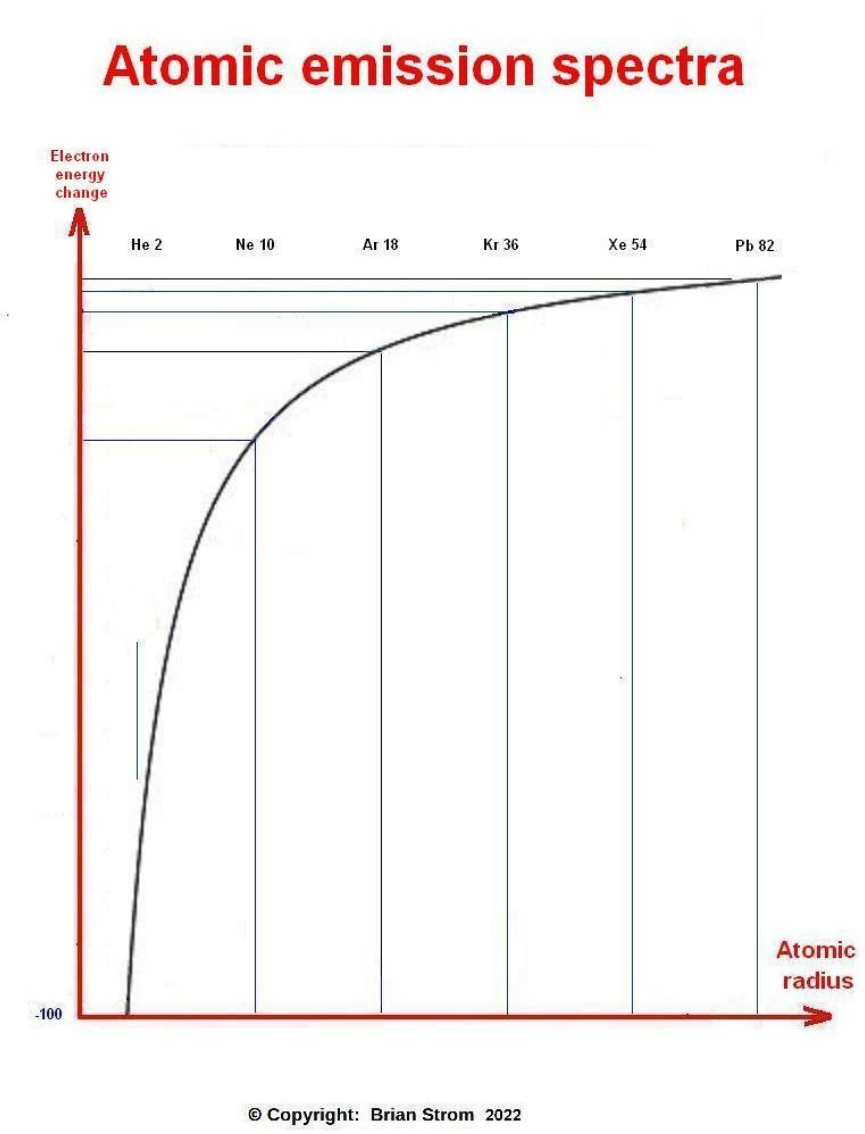


Figure 7. Electron fall energies form a 1/r profile.

The suggested model of the layers in the electron cluster is shown in Figure 8.

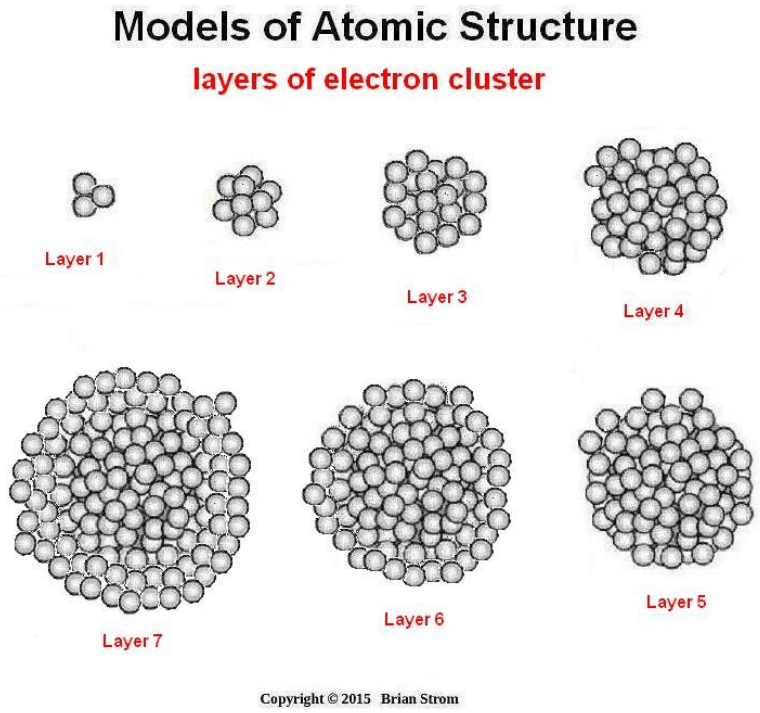


Figure 8. Suggested layers in the electron cluster.

For the lighter atoms, the profile of electron fall energies suggests the electron cluster is loosely-packed such that electrons can fall through the layers quite easily.

For the heavier atoms, with more nuclear protons and a deeper Potential Energy Well, the inner layers of electrons appear to be more tightly-packed. Hence the falling electrons can only penetrate through the outer layers of the cluster.

For an electron cluster with a given number of layers, the electron fall energies increase as the number of protons in the nucleus increases and the "depth" of the atomic Potential Energy Well increases.

4. Summary & Conclusions

This paper has analysed the information contained in Atomic Emission Spectra. The data is used to explore the conjecture that every atom is comprised of a small heavy nucleus of protons surrounded by a cluster of much larger electrons, filling the nuclear Potential Energy Well.

For each atom, the common assumption is that the outer electrons will be stationary at absolute zero, but will be actively "bubbling" up and down as the temperature increases above absolute zero.

Whilst the size of the electron cluster increases in step changes, the cluster then gradually becomes more compressed as more protons are added to the nucleus.

The profile of atomic sizes for the elements is similar to the measured and calculated variations in atomic sizes, as commonly published.

The spacing between the discontinuities could be an indication of the size of the electron. If correct, it suggests that electrons are much larger than in the Standard Model conjecture. See Figure 9:

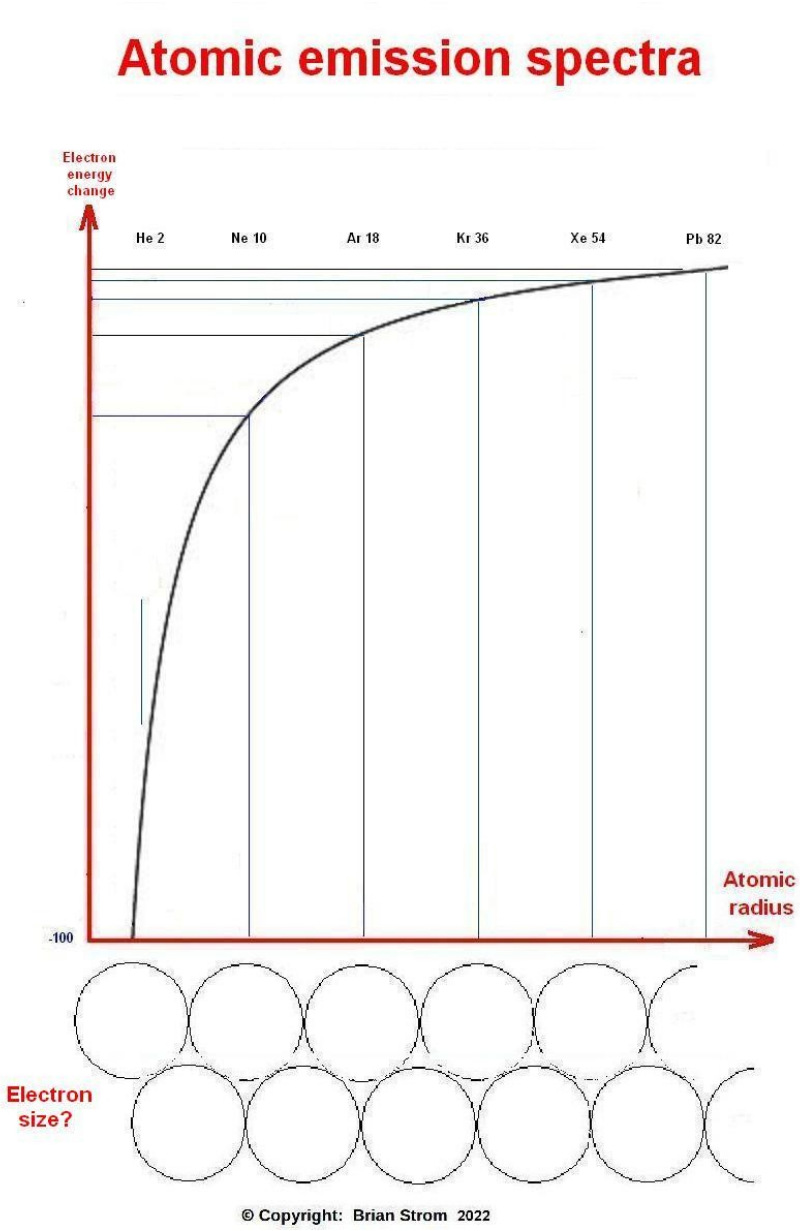


Figure 9. An indication of the size of the electron?

The conclusion is that the Atomic Structure is at odds with the Standard Model. The update is shown in Figure 10.

For Hydrogen, the suggested image is a small cluster of electrons surrounding the single proton in the nucleus. The suggested image of the Carbon atom is a larger, multi-layer cluster of electrons surrounding a nucleus of six protons. The volume of the three-dimensional atomic Potential Energy Well for Carbon is larger than for Hydrogen and, therefore, the number of electrons sitting in the Potential Energy Well is greater.

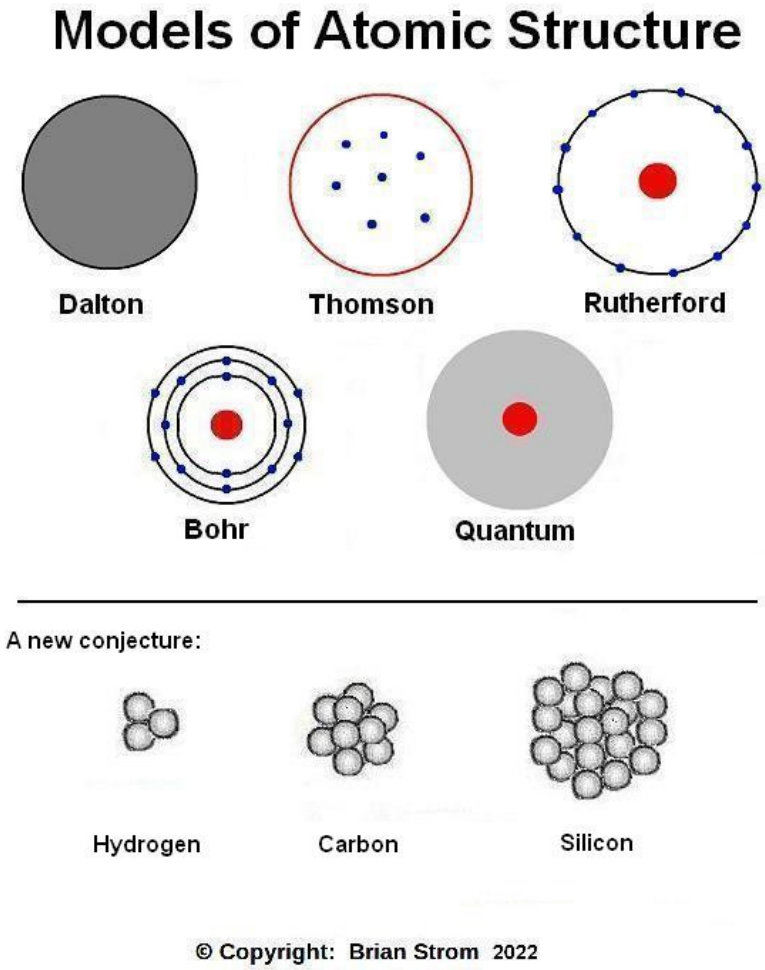


Figure 10. The updated model of Atomic Structure.

An earlier paper **[4]**, suggests how the underlying structure and symmetry of the protons in the atomic nucleus could affect the symmetry of the surrounding electron cluster. This could explain why the emission spectra for different elements have similar, but different, profiles.

For instance, in a comparison of the shape of the emission profile for Magnesium, Calcium & Strontium, there are some similarities and some differences. See Fig 11.

These similarities and differences will be examined, in detail, in a later paper.

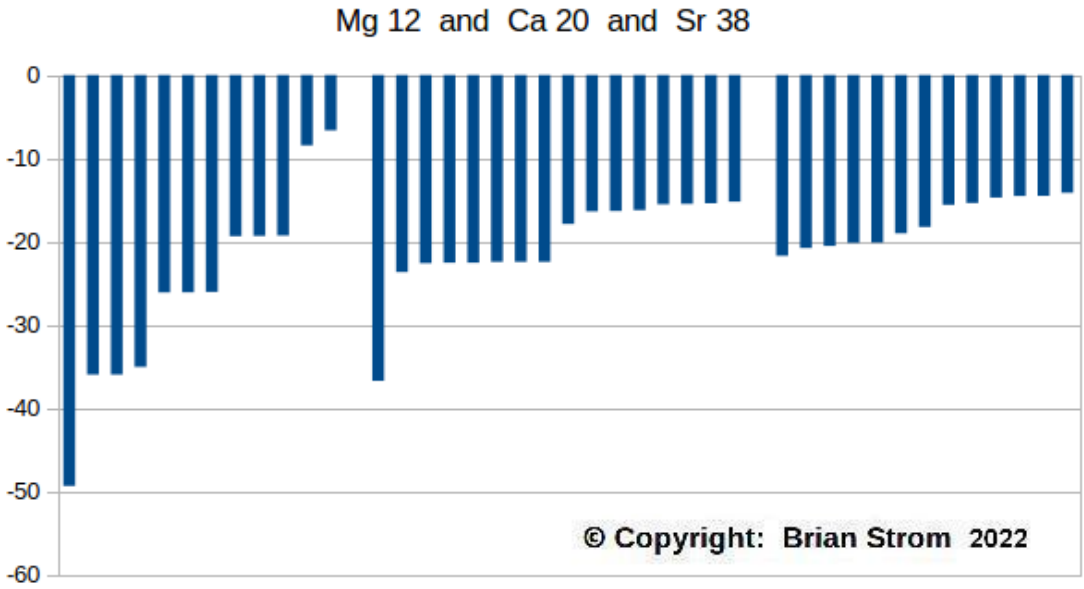


Figure 11. Similarities in emission profiles.

REFERENCES

[1] National Institute of Standards and Technology - Basic Atomic Spectroscopic Data: https://www.nist.gov/

[2] Brian STROM. "AI" Physics – Atomic Structure (Part 1). viXra: 1811.0162 November 2018.

[3] Compendium of Chemical Terminology, 2nd edition. Compiled by A. D. McNaught and A. Wilkinson. Blackwell Scientific Publications, Oxford (1997).

[4] Brian STROM. "AI" Physics – Atomic Structure - (Part 2). viXra: 1911.0159 November 2019.

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ANNEX 1.

Spectral emission lines for Hydrogen in the National Institute of Standards and Technology - Basic Atomic Spectroscopic Data.

HYDROGEN		
Intensity	Spectral Wavelength	Spectral energy proportional to inverse of wavelength
15	926.2256	-10.39
20	930.7482	-10.37
30	937.8034	-10.33
50	949.743	-10.26
100	972.5367	-10.14
300	1025.7222	-9.87
1000	1215.66824	-9.07
500	1215.67364	-9.07
5	3835.384	-5.11
6	3889.049	-5.07
8	3970.072	-5.02
15	4101.74	-4.94
30	4340.462	-4.80
30	4861.2786	-4.54
10	4861.287	-4.54
60	4861.3615	-4.54
90	6562.711	-3.90
30	6562.7248	-3.90
180	6562.8518	-3.90
5	9545.97	-3.24
7	10049.4	-3.15
12	10938.1	-3.02
20	12818.07	-2.79
40	18751.01	-2.31
5	21655.3	-2.15
8	26251.5	-1.95
15	40511.6	-1.57
4	46525.1	-1.47
6	74578	-1.16
3	123685	-0.90

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ANNEX 2.

An earlier paper **[2]** shows the analysis of the Electron Ionization energy levels for different atoms – when electrons are ejected from the atom.

For the heavier atoms with more protons and a deeper Potential Energy Well, the ionization energies increase with the square of the proton number. This conforms to the mathematics of the Potential Energy Well.

The published ionization numbers **[3]** only show one-level-per-electron, whereas the NIST data on Atomic Emission Spectra suggests there are many more electron energy levels than in the Standard Model.

Is the ionization data accurate?
Has it been manipulated to avoid contradiction with the Standard Model?

Some extra lines may be caused by the naturally occurring isotopic mix for each element in the NIST database.

But the emission spectra show no sign of patterns correlating to the Bohr/Rydberg conjectures. Bohr guessed at simple ratios and a small number of electrons in regimented orbits. But his data was incomplete.

The NIST data shows a different story, and Bohr's theory does not fit the data.