

# Classifying chemical elements from sixteen oscillatory patterns

## A periodic table required for negative mass elements ?

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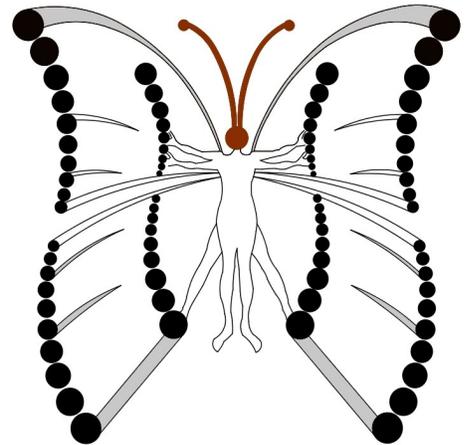
**Abstract:** The immeasurable variety of oscillatory patterns pervading the vacuum constitutes the background of the physical universe. It also comprises the biofield that provides critical information for sustaining life. The existence of sixteen vibrating energies or “sounds” related to 128 chemical elements is set forth. Chemical elements with negative mass are proposed. The clustering of those negative mass elements could account for dark matter.

### 1. Introduction

Einstein theory of spacetime reveals that the universe is not silent but alive with vibrating energy. Electromagnetic frequencies, sound vibrations, and gravitational waves give rise to a symphony of oscillatory patterns throughout this “musical” universe. These variable scale oscillatory patterns may be perceived by living beings or conscious observers as colors, sounds, forms, shapes, and self-existent entities.

Further, some of the oscillatory patterns carry indispensable information for a variety of processes we take for granted, from the quantum scale to life development and sustainment. As exquisitely written by Muehsam and Ventura [1], a new paradigm in Science is expressly required to take into account this biofield and bioinformation which, via electromagnetic energy and sound vibration, sustain life in its grandiose biodiversity.

**Figure 1:** Da Vinci’s vitruvian man revisited, holding on to the duality wave-particle as the source of it’s physical existence, and also depicting it’s own dual nature from matter and consciousness. More importantly, the antenna reflect the constant exchange of information with the biofield, without which life, as we know, would be impossible. The brain appears to be the perfect interface required for this exchange to occur. The ratio of the two wavelength is indeed the ubiquitous golden mean  $\phi$ .

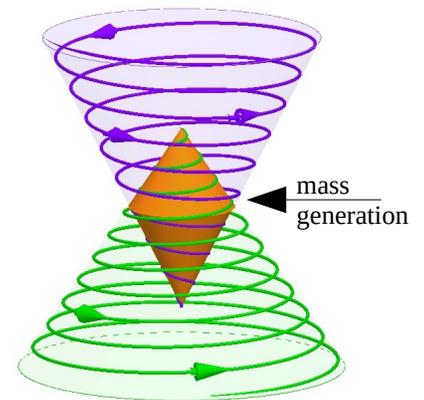


At the quantum scale, oscillation is energy and mass. It is generally accepted that energy is more important than mass, and hence, mass may be viewed as a sub-product of energy. As a result, mass-energy equivalence should be written in the direction  $m=E/c^2$  which implies that mass is a result of motion amplitude relative to the speed of light. Paradoxically, what is called inertial mass may therefore be an illusion produced by motion of oscillatory energy. Further, these motions are often spiralic in nature. As depicted in Fig.2, mass seems to be generated from the integration and contraction of two opposing spirals of energy carrying quantized angular momenta relative to the Z-axis chosen as reference. Simultaneously, this mechanism gives rise to the spin and magnetic moment of a particle. This figure echoes some of the concepts published by W. Russell in the 1920’s [2].

**Figure 2:** Concept of mass generation from the integration and contraction of two opposing spirals carrying quantized angular momenta. Particle spin and magnetic moment naturally emerge from this process. As for the spiral proton, it was found that the projection along the z-axis of the two opposing angular momenta were respectively equal to  $\hbar/2\phi$  and  $\phi\hbar/2$ , with  $\phi$  being the golden ratio. The difference between the two produces exactly  $\hbar/2$  for the proton spin as indicated below [3,4].

$$\frac{\hbar\phi}{2} - \frac{\hbar}{2\phi} = \frac{\hbar\phi}{2} - \frac{\hbar(\phi-1)}{2} = \frac{\hbar}{2}$$

Matter consists of atomic and sub-atomic constituents that are in constant motion, vibrating and spinning. And in this musical universe, matter has a specific partition, where chemical elements appear related to specific vibratory patterns. As in the words of the 12<sup>th</sup> century famous mystic and philosopher Mawlana Jalal-al-Din Rumi [5]: “Poems are rough notations for the music we are...”



## 2. How do matter and sound relate ?

### 2.1 At the macroscopic scale

The curious response of baryonic matter to sound vibration at the macroscopic scale was first noticed by Galileo nearly four centuries ago, when scraping a brass plate with a sharp iron chisel [6]. Galileo soon realized that the sound produced by the chisel on the plate produced “*long rows of fine streaks parallel and equidistant from one another*”. Later in the same 17<sup>th</sup> century Robert Hooke, and a century later Friedrich Chladni, successively developed the idea and improved the experiments, demonstrating clearly that sound frequencies induce self-assembly of matter at the macroscopic scale, resulting in the emergence of various and complex nodal patterns [7].

But it was a Swiss medical doctor and Anthroposophist, Hans Jenny who, throughout the 1960s up until his death in 1972, took a methodological and exhaustive approach to documenting Cymatic phenomena. He coined the term “Cymatics” in his 1967 book entitled *Kymatik* [8]. Cymatics demonstrates vividly how sound influences matter self-assembly at the macroscopic scale.

**Figure 3:** Complexity and self-arrangement in nature. Can sunflower structure be driven by external vibrational “impulsion”, such as sound waves, and not only by genes ?



### 2.2 At the molecular scale

At the molecular scale, it has been shown how molecular self-assembly and patterning can be induced by sound waves, notably ultrasounds [9]. This is particularly the case for organogels and polymers [10], but also for organic and metal coordination compounds [11]. Therefore, sound waves are increasingly used as a stimulus for effecting supramolecular self-assemblies, through local effects on the surrounding solvent, which can combine and be amplified along the molecular chain [12-14].

### 2.3 In biological processes

Sounds propagate around 4-5 times faster in water than air, and living organisms on earth are composed of >75% of water, including and surprisingly the brain cavity in mammals. The ability of water molecules to form a vast array of hydrogen-bonded supramolecular assemblies can be triggered by sound waves [15]. These superstructures have an impact on the dynamics of water properties which, in turn, induce or modify certain biological processes.

Similarly, the 2014 review article from Muehsam and Ventura wonderfully illustrates how electromagnetic energy and sound wave can modulate gene expression for biological signaling and healing [1]. This article also mentions cell reprogramming from sound vibration. Further, a 2017 article shows how audible sounds in the form of spoken words and phrases can be used as an epigenetic tool in healing symptoms of autism [16]. The authors discovered that living human DNA can be changed and rearranged with spoken words and phrases. A fundamental question remains: to which extent the man-made electromagnetic fog and noise pollution detrimentally interfere with the bioinformation from the biofield?

### 2.4 Sweeping evidence under the rug

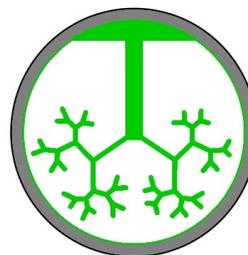
Nearly four centuries after its discovery, Cymatics is still labeled as “pseudoscience” and therefore mostly ignored. However, it has been long lasting practice for human to push certain evidence under the rug, endeavoring to ignore or ridicule it, and keeping it away from media, especially when driven by financial interests. Yet, irrefutable evidence keeps coming back. That was the case for Einstein’s cosmological constant which was simply ignored by physicists for decades, but it kept re-appearing in equations. Similarly, negative mass was first suggested by Bondi >60 years ago and ignored by the majority of theorists until recently. Likewise, consciousness is still considered today as an emerging phenomenon from the complexity of the brain, despite growing and compelling evidence suggesting that consciousness might be prior to baryonic matter and pervading the whole universe [17-18]. How can this be reconciled with our current understanding of Cosmology and the Big Bang theory?

### 3. The current periodic table of positive mass elements

The current presentation of the periodic table is based on the electronic configuration of the elements, a consequence of quantum mechanics shell structure, with orbitals being progressively filled by electrons as  $Z$  increases. Elements appearing in the same group (column) show, as a general trend, similar chemical properties. However, there are a number of issues associated with the current ordering of the table, in particular the placement of some of the elements is disputed. The periodic table has been around for more than a century and survived a number of revolutionary discoveries such as quantum physics, the theory of relativity, and the quark substructure .

A wide number of attempts to design the periodic table differently have been proposed, and, according to E. Scerri [19], over 1000 of them have been published in articles or on websites. This abundance of designs may underlie the fact that the current presentation based on the electronic configuration may not reflect the true nature of chemical elements. The answer to the appropriate classification of the chemical elements taking into account their vibrational nature could possibly be found in metaphysics.

Chemical elements are not isolated and independent entities dispersed across the cosmos. Indeed, they are integral part of a global cosmic web structure which, as discussed in the introduction, is mostly vibrational in nature. And the ensemble of oscillatory patterns making up the fabric of spacetime is the result of successive self-divisions and re-combinations from the primal cosmic Substance [20,21]. This universe appears like a binary fractal tree, as succinctly depicted in Fig.4, where all the vibrational motifs result from the multiple divisions, subdivisions and/or merging of that initial "Substance", as called by Spinoza [22].

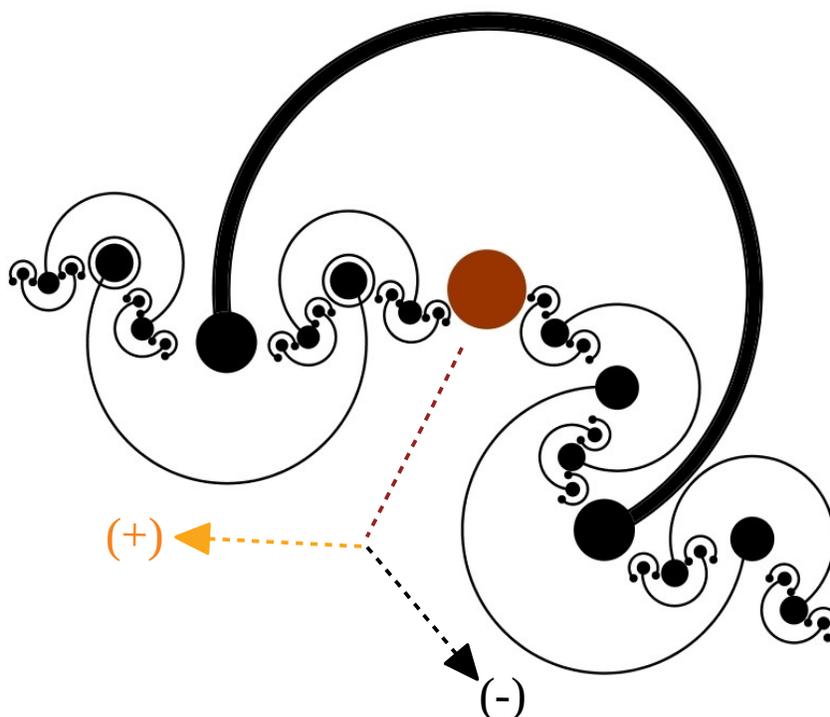


**Figure 4:** The cosmic constituents stemming from successive self-divisions of the primal cosmic Substance.

### 4. Chemical elements and 16 "pure sounds". Introducing negative mass elements.

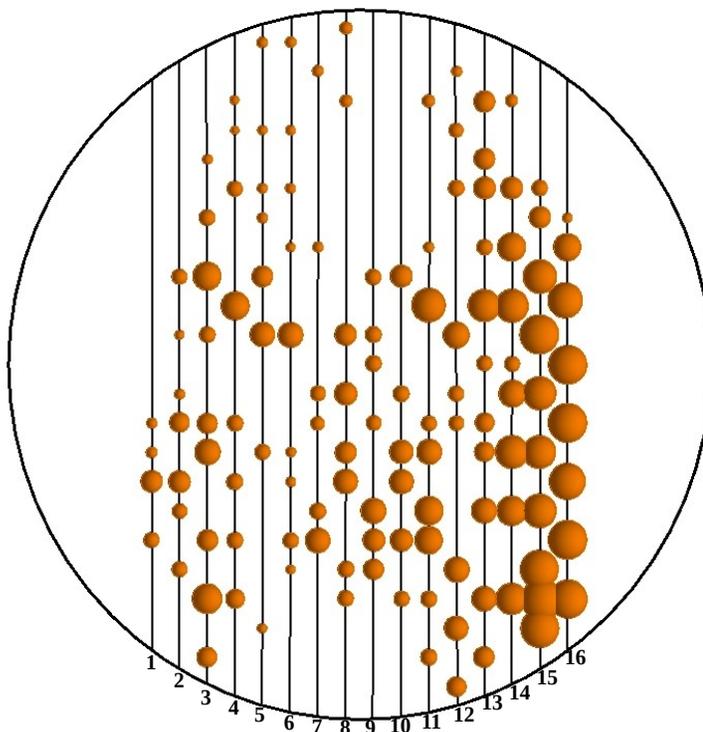
In this musical universe, chemical elements can be related to 16 vibratory patterns, from which they may be grouped or classified. The energy of those vibratory patterns are the result of five successive divisions (five octaves) producing  $2^5=32$  main oscillatory patterns (which we may call "vibrations" or "sounds" although not being mechanical waves per se), as shown in Fig.5. Divisions ratios, which are very likely related to the golden ratio, are not 1:1 in magnitude, and as such, lead to non-equivalent 32 "sounds". Further, those 32 vibrations are divided into positive and negative sectors with 16 vibrations each, referring to Sakharov twin universe, with elements bearing positive mass (baryonic matter) and elements with negative mass. Coincidentally, the Tantric cosmology (Vishuddha) also refers to "16 pure sounds" (or 16 Sanskrit vowels) [23-24].

**Figure 5:** Emergence of sixteen vibrational patterns linked to positive mass elements on the left hand side, and sixteen other vibrational patterns linked to the negative mass elements on the right hand side. The cycles of life and death only pertains to the positive mass side.

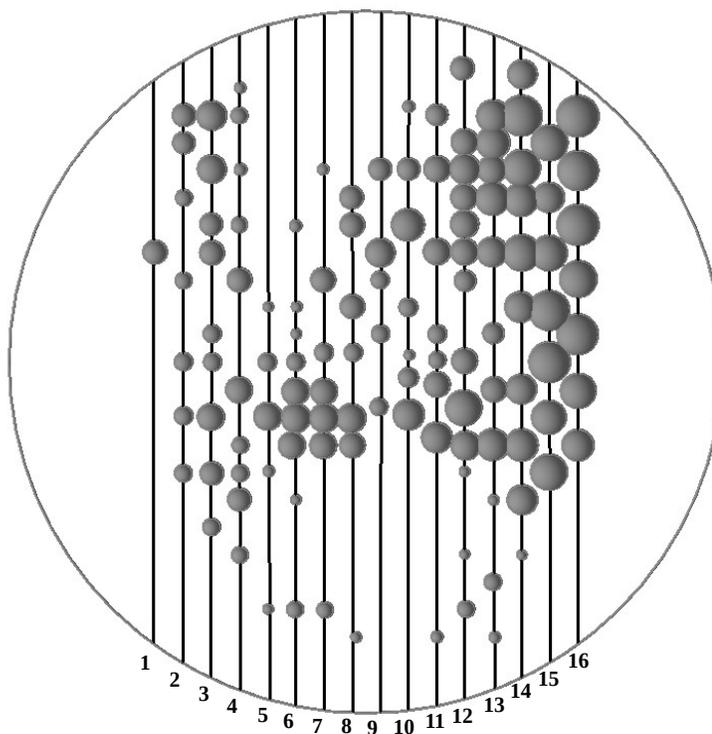


In Fig.6 and 7, positive mass elements and negative mass elements are ordered in accordance to their respective relation to the sixteen vibrational patterns. Each vibratory pattern (or string), numbered arbitrarily, relates to 1-13 elements. There are a total of 128 chemical elements on the positive side, while the negative side contains 123 elements. Elements are identified by their radii. Those radii in picometer (pm) are provided in Tables 1 & 2.

**Figure 6:** Positive mass elements ordered in relation to sixteen vibrational patterns

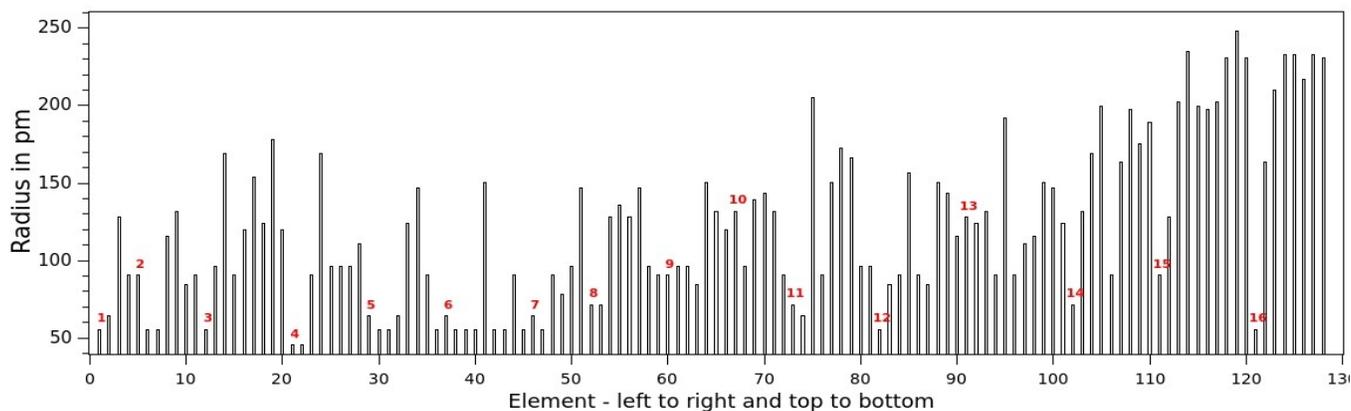


**Figure 7:** Negative mass elements ordered in relation to sixteen vibrational patterns



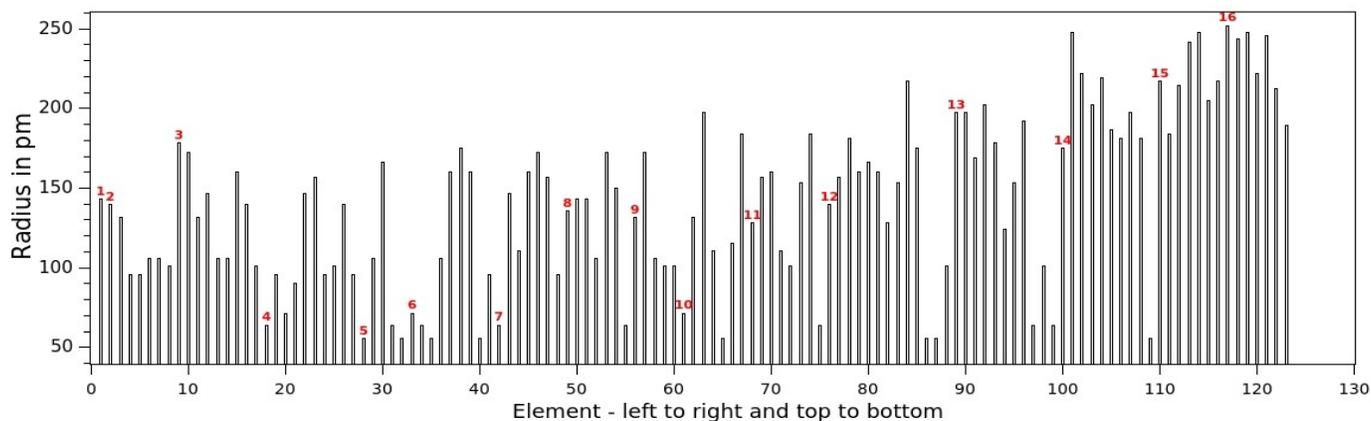
**Table1:** Radii for positive mass elements expressed in picometer (pm, estimated at  $\pm 10\%$ ). Left to right and top to bottom in Fig.6

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
55	90	55	45	64	64	64	72	90	132	72	55	128	72	90	55
64	55	96	45	55	55	55	72	96	96	64	85	124	132	128	163
128	55	169	90	55	55	90	128	96	140	205	90	132	169	202	210
90	115	90	169	64	55	78	136	85	143	90	157	90	200	235	233
	132	120	96	124	150	96	128	150	132	150	90	192	90	200	233
	85	154	96	147	55	147	147	132	90	172	85	90	163	197	217
	90	124	96	90	55		96	120		166	150	111	197	202	233
		178	111	55	90		90			96	143	115	175	231	231
		120		55	55					96	115	150	189	248	
												147		231	
												124			



**Table2:** Radii for negative mass elements expressed in picometer (pm, estimated at  $\pm 10\%$ ). Left to right and top to bottom in Fig.7

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
143	140	178	64	55	72	64	136	132	72	128	140	197	175	217	252
	132	172	96	106	64	147	143	172	132	157	157	197	248	184	244
	96	132	72	166	55	111	143	106	197	160	181	169	222	215	248
	96	147	90	64	106	160	106	101	111	111	160	202	202	242	222
	106	106	147	55	160	172	172	101	55	101	166	178	219	248	246
	106	106	157		175	157	150		115	154	160	124	187	205	212
	101	160	96		160	96	64		184	184	128	154	181	217	189
		140	101		55					64	154	192	197		
		101	140		96						217	64	181		
			96								175	101	55		
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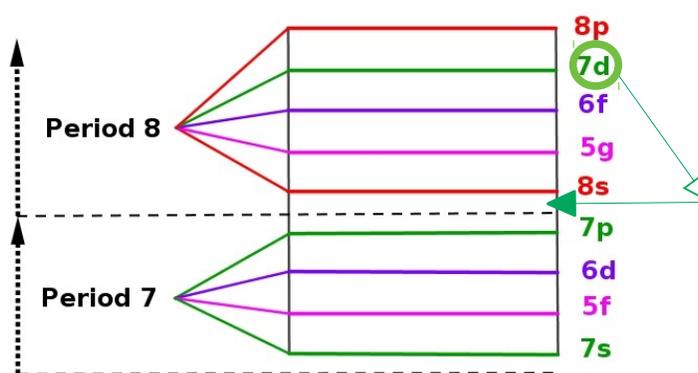
## 5. Discussion

Today, negative mass is no longer an exotic object. It was certainly the case in the years following Bondi seminal paper entitled "Negative Mass in General Relativity" in 1957 [25]. In the 1960's Sakharov proposed it's theory of "twin universe" with opposite arrows of time, and in 1970, J.M. Souriau demonstrated that reversing the arrow of time was equivalent to inverting the energy of a particle (hence its mass) [26]. Taking on this matter, JP Petit has elaborated a bimetric model where positive and negative mass can coexist without mutual annihilation when they follow different geodesics [27-29]. Since then, the number of articles dealing with negative mass has been steadily growing [30-33].

In fact, the positive energy condition is not required for the mathematical consistency of general relativity, and as long as energy and mass have the same sign, the energy mass equivalence principle can still apply. Today, it has become more and more accepted that the majority of energy and mass in the vacuum could be negative, including the cosmological constant. The clustering of negative mass elements proposed in this article would perfectly account for the dark matter of the  $\Lambda$ CDM theory.

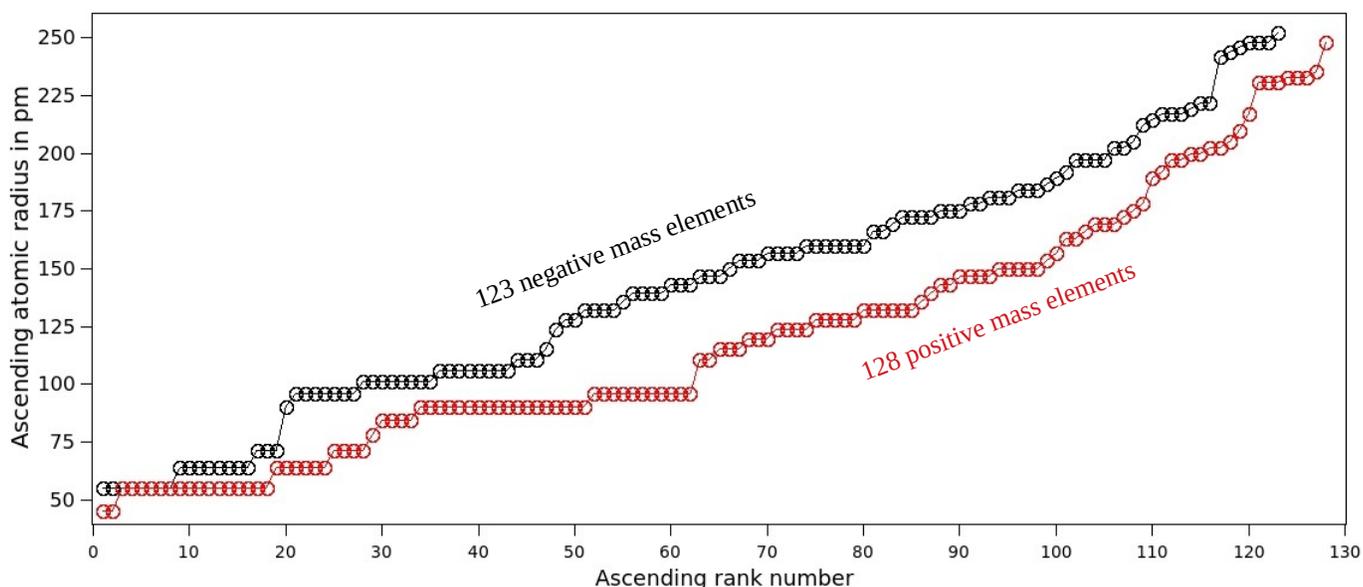
On the positive mass side, the number of elements proposed is 128. This number was also suggested by J. Emsley [34]. This could imply that the orbital 7d is lower than the orbital 8s and, as shown in Fig.8, period 8 would be restricted to the orbital 7d which contains 10 elements. Added up to the currently known 118 chemical elements, the number  $Z=128$  is obtained. Further, this number is in agreement with the island of stability, predicted to be centered around  $Z=126$  [35].

**Figure 8:** The orbital 7d could be lower than 8s. This would account for 128 positive mass chemical elements, with period 8 containing solely the orbital 7d.



The graph in Fig.9 presents the positive and negative mass chemical elements in radius ascending order.

**Figure 9:** Radii of positive mass elements (red) and negative mass elements (black) in ascending order ( $\pm 10\%$  accuracy)



## 8. References

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