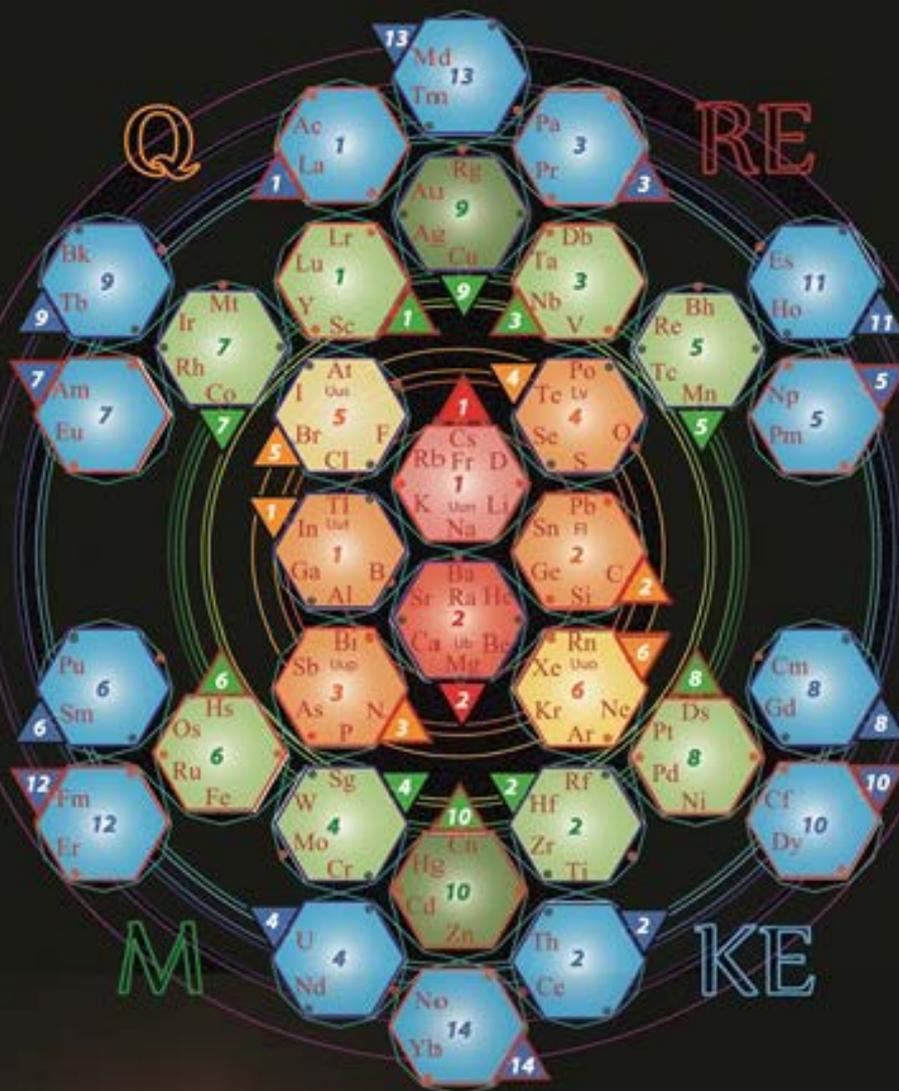


TETRYONICS

The charged topology of periodic & compound Matter



Foundational Quantum Chemistry

Abraham

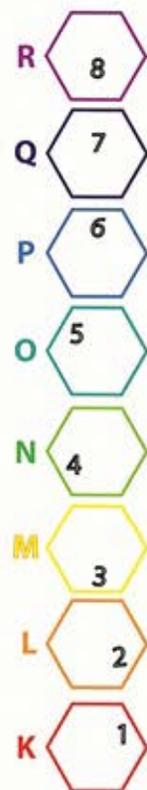
ISBN 978-0-987288-3-1

[Second Edition © 2012]

Alkali Metals

The alkali metals are silver-colored (caesium has a golden tinge), soft, low-density metals, which react readily with halogens to form ionic salts, and with water to form strongly alkaline (basic) hydroxides.

These elements all have one electron in their outermost shell, so the energetically preferred state of achieving a filled electron shell is to lose one electron to form a singly charged positive ion.

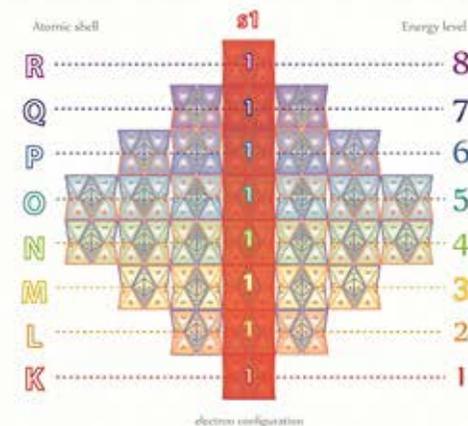
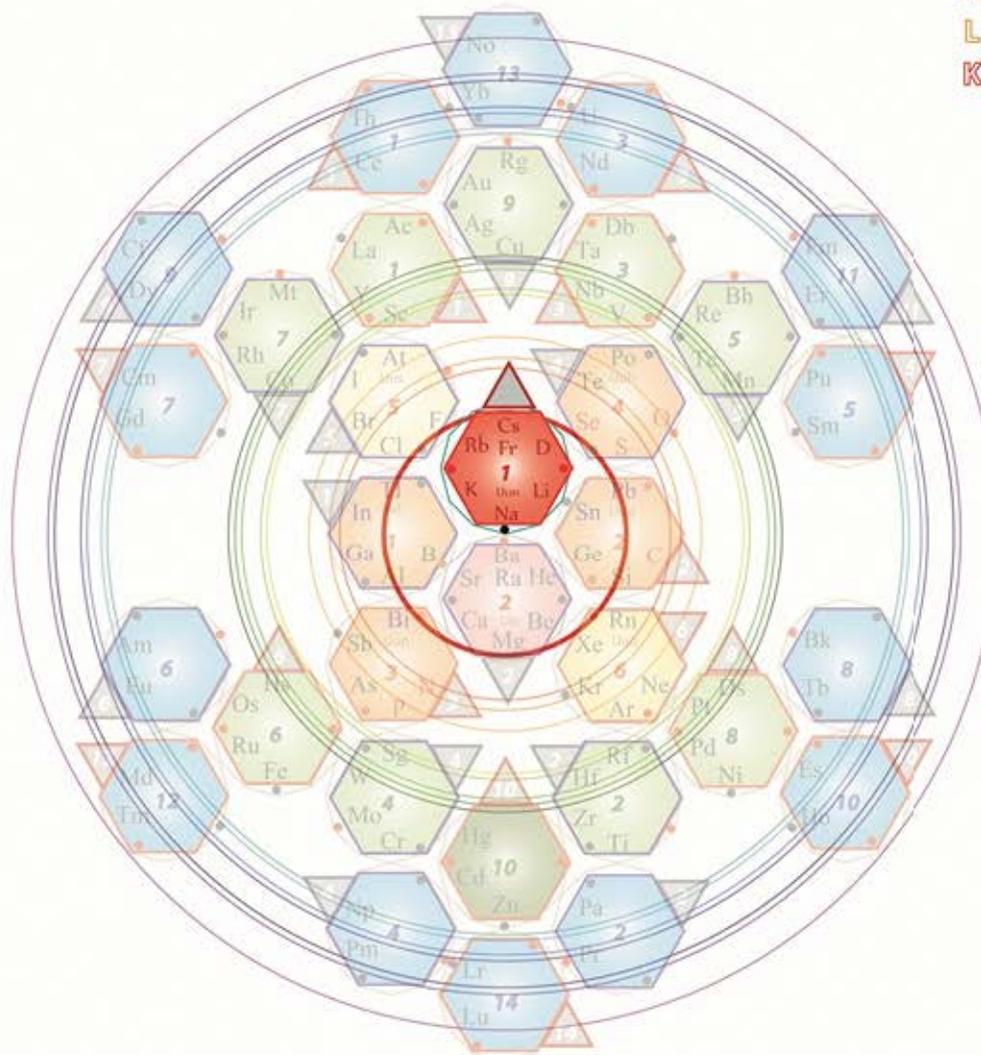


Shell Quantum level

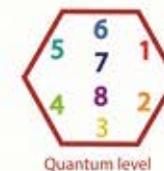


s Orbital

**n1-8
s1 sub-orbital**



**8
Alkaline Metals**



The alkali metals are all highly reactive and are never found in elemental form in nature.

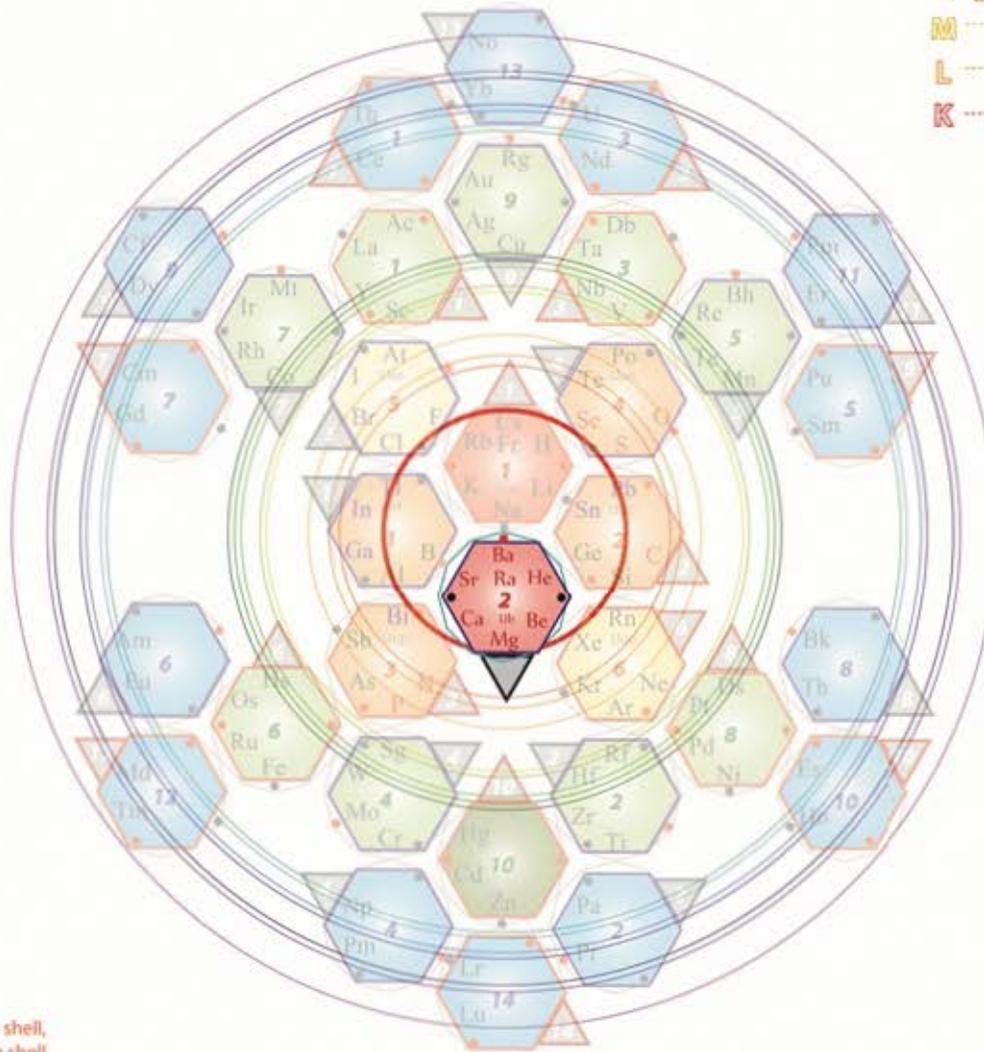
As a result, in the laboratory they are stored under mineral oil. They also tarnish easily and have low melting points and densities. Potassium and rubidium possess a weak radioactive characteristic (harmless) due to the presence of long duration radioactive isotopes.

Alkaline Earths

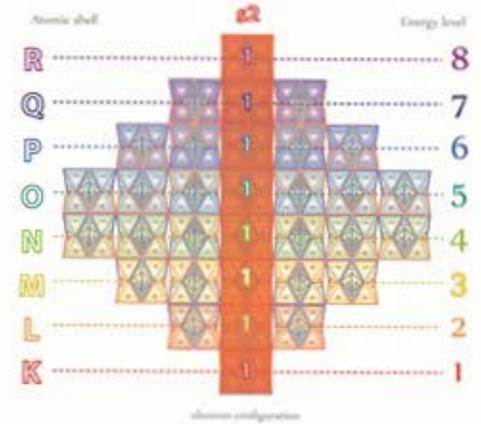
The alkaline earth metals are silver colored, soft metals, which react readily with halogens to form ionic salts, and with water, though not as rapidly as the alkali metals, to form strong alkaline (basic) hydroxides.



All the alkaline earth metals have two electrons in their valence shell, so the energetically preferred state of achieving a filled electron shell is to lose two electrons to form doubly charged positive ions.



8
Alkaline Earths



Metalloids

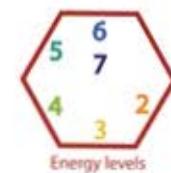
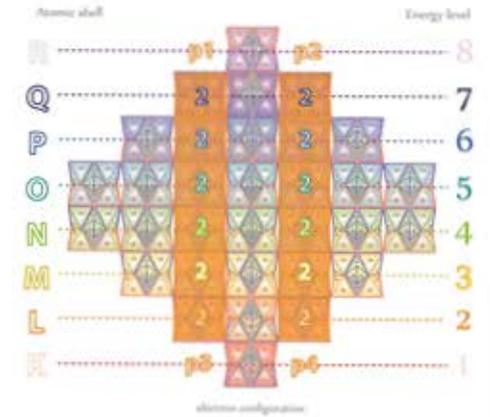
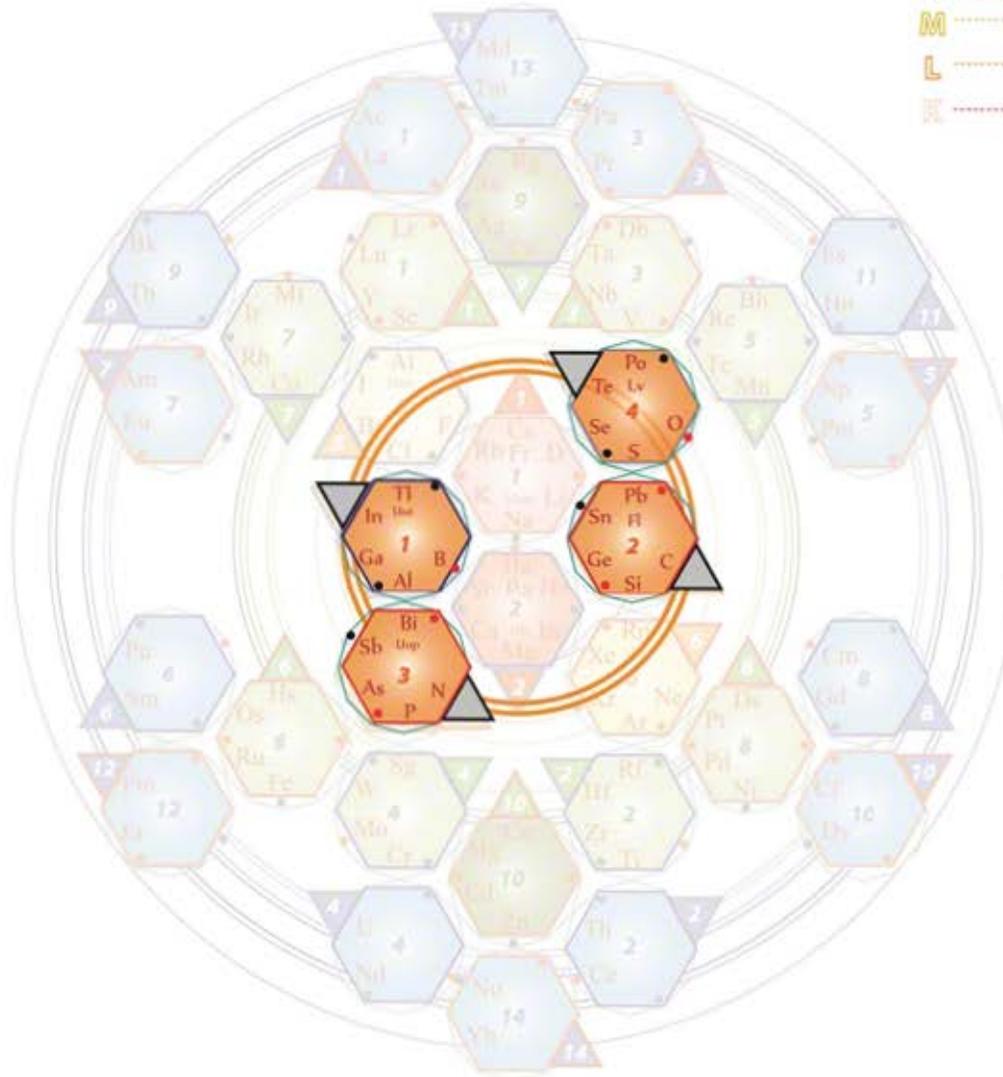
A metalloid is a material with a small overlap in the energy of the conduction band and valence bands.

Unlike a regular metal, metalloids have been described electrically as charge carriers of both types (holes and electrons), so it could be argue that they should be called 'double-metals' rather than metalloids.

As metalloids have fewer charge carriers than metals, they typically have lower electrical and thermal conductivities.



Charge carriers typically occur in much smaller numbers than in a real metal. In this respect they resemble degenerate semiconductors more closely. This explains why the electrical properties of metalloids are halfway between those of metals and semiconductors.

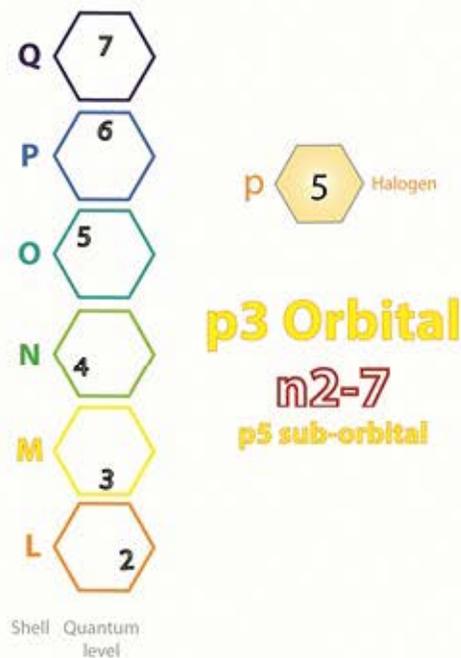


Halogens

Owing to their high reactivity, the halogens are found in the environment only in compounds or as ions.

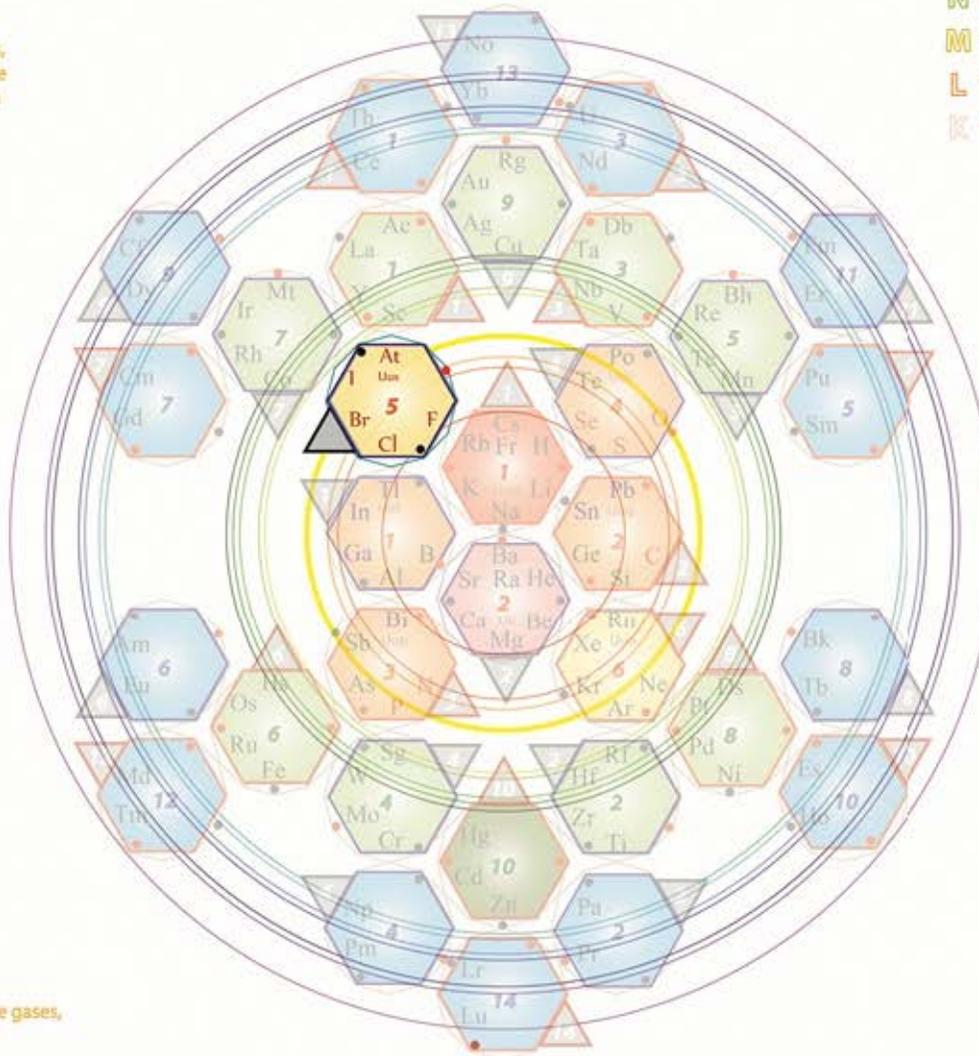
Halide ions and oxoanions such as iodate (IO₃⁻) can be found in many minerals and in seawater.

Halogenated organic compounds can also be found as natural products in living organisms. In their elemental forms, the halogens exist as diatomic molecules, but these only have a fleeting existence in nature and are much more common in the laboratory and in industry.



At room temperature and pressure, fluorine and chlorine are gases, bromine is a liquid and iodine and astatine are solids.

Group 17 is therefore the only periodic table group exhibiting all three states of matter at room temperature



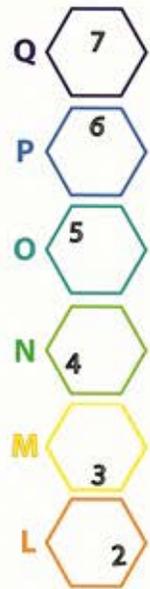
6
Halogens



Nobel Gases

The properties of the noble gases can be well explained by modern theories of atomic structure: their outer shell of valence electrons is considered to be "full", giving them little tendency to participate in chemical reactions, and only a few hundred noble gas compounds have been prepared.

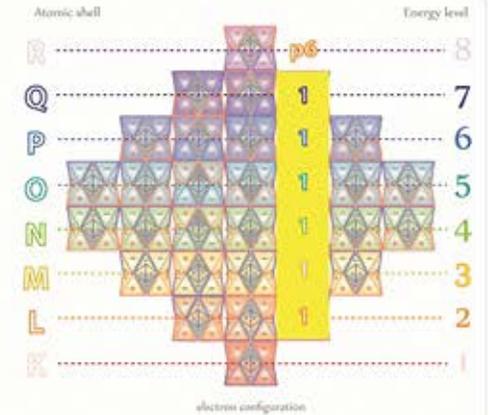
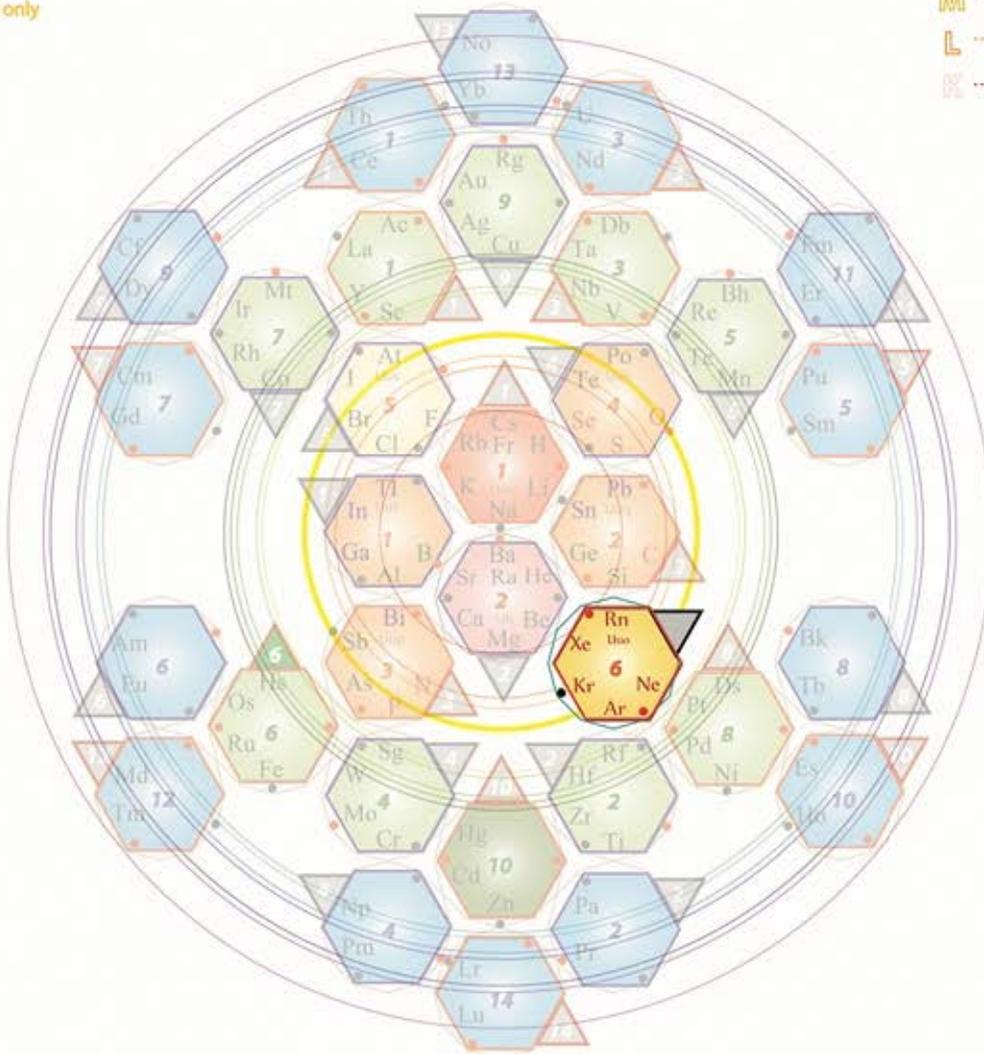
The melting and boiling points for each noble gas are close together, differing by less than 10 °C (18 °F); consequently, they are liquids only over a small temperature range.



Shell Quantum level



**completed
p3 Orbital**
**n2-7
p6 sub-orbital**



**6
Nobel Gases**



Neon, argon, krypton, and xenon are obtained from air using the methods of liquefaction of gases and fractional distillation.

Helium is typically separated from natural gas, and radon is usually isolated from the radioactive decay of dissolved radium compounds.

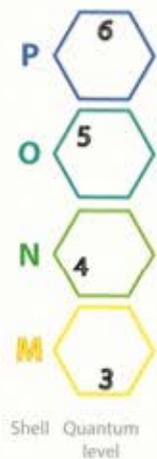
Transitional Metals

In chemistry, the term transition metal commonly refers to any element in the d-block of the periodic table, including the group 12 elements zinc, cadmium and mercury.

This corresponds to groups 3 to 12 on the periodic table, which are all metals.

More strictly, IUPAC defines a transition metal as "an element whose atom has an incomplete d sub-shell, or which can give rise to cations with an incomplete d sub-shell."

The first definition is simple and has traditionally been used. However, many interesting properties of the transition elements as a group are the result of their partly filled d subshells.



d 1-8 Transition Metal

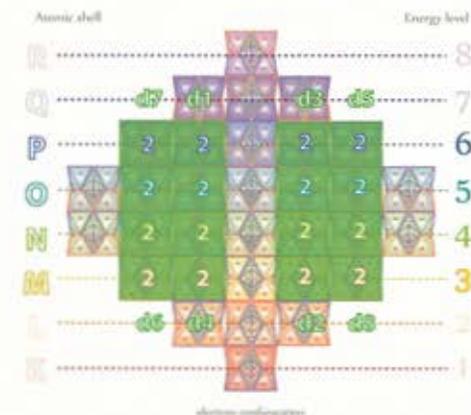
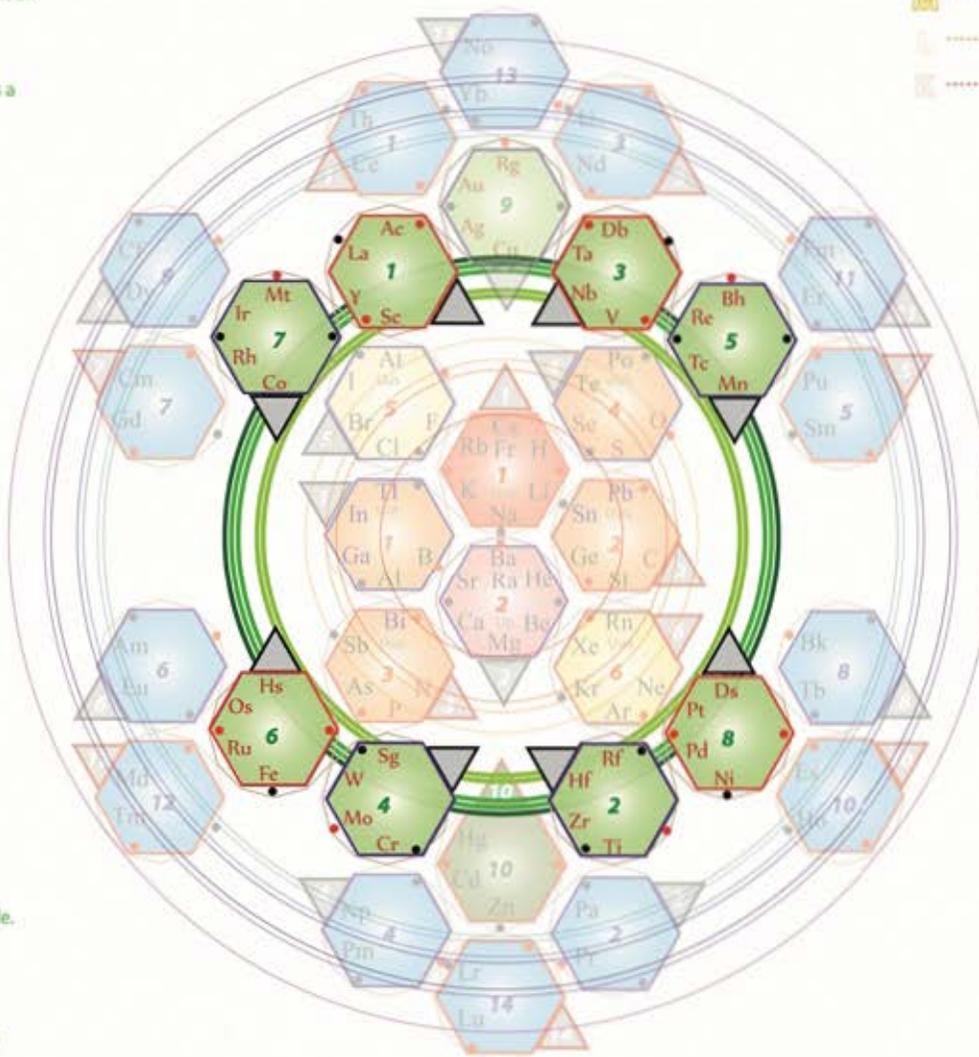
4 d-Orbitals

$n3-6$

d1-8 sub-orbitals

The name transition comes from their position in the periodic table. In each of the four periods in which they occur, these elements represent the successive addition of electrons to the d atomic orbitals of the atoms.

In this way, the transition metals represent the transition between group 2 elements and group 13 elements.



32
Transition
Metals



Post-Transition Metals

In chemistry, the term post-transition metal is used to describe the category of metallic elements to the right of the transition elements on the periodic table.

There are two IUPAC definitions of "transition element" that have been in apparent conflict with one another since September 2007.

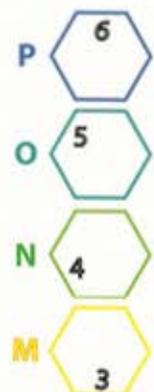
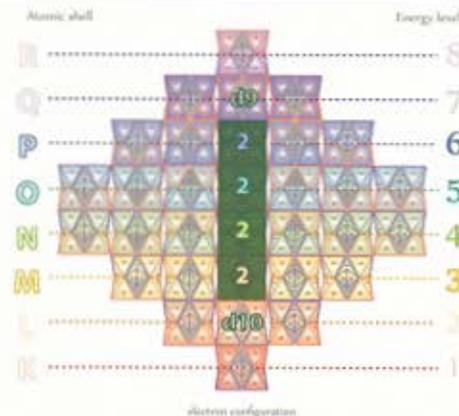
According to the first definition, transition metals are elements in group 3 through group 11.

In this case, post-transition metals include all of group 12—zinc, cadmium, mercury, and ununbium.

According to the second definition, transition elements either have an incomplete d-subshell or have the ability to form an incomplete d-subshell.

Post Transitional metals are normally defined as completed d orbitals

Tetryonics suggests it may be appropriate to include all the d5 orbital elements in this grouping



Shell Quantum level

d 9-10 Post Transition Metal

d5 Orbital

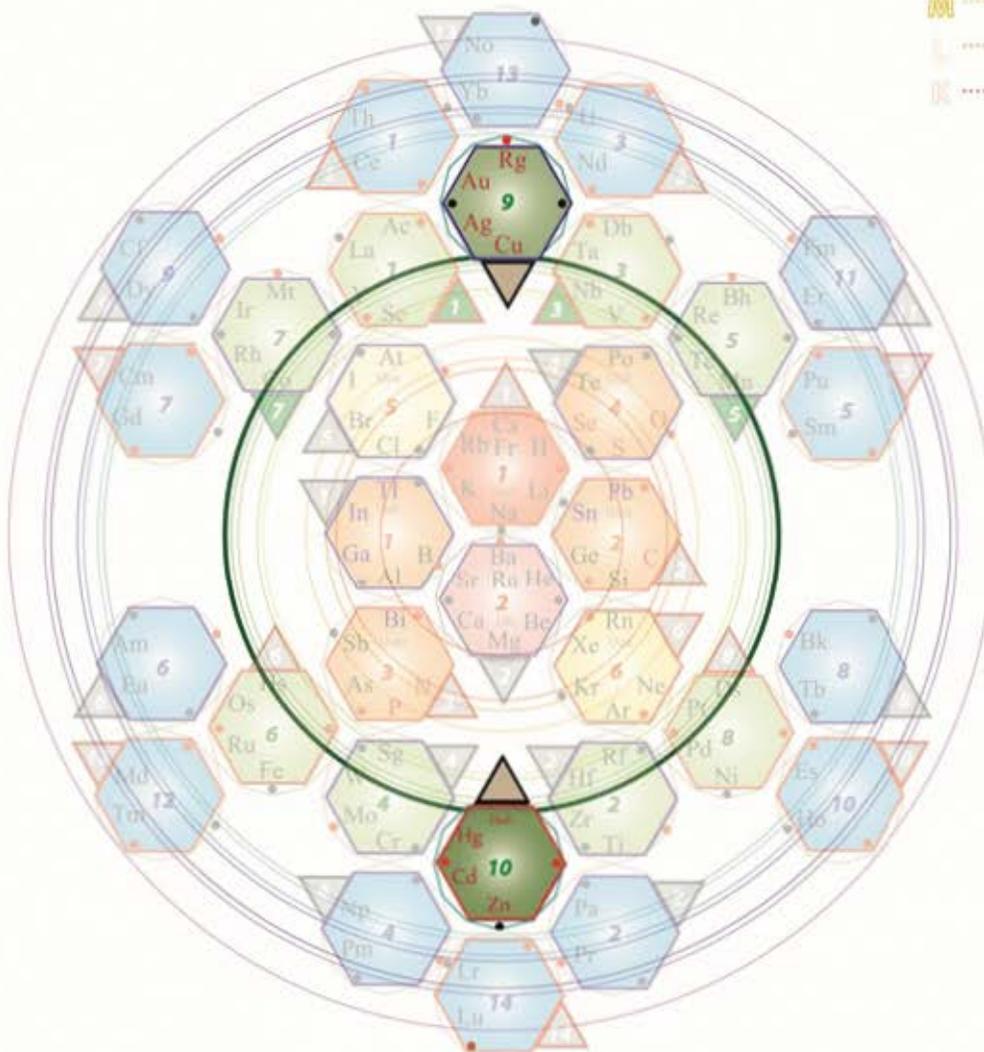
n3-6

d9-10 sub-orbitals

**8
Post-transitional
Metals**



Quantum level



In 2007, mercury(IV) fluoride was synthesized.[2][3] This compound contains a mercury atom with an incomplete d-subshell, and ununbium is predicted to have the capacity to form a similar electronic configuration.

In this case, post-transition metals include only zinc and cadmium within group 12.

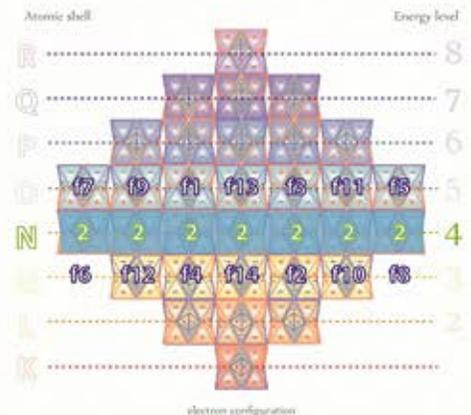
Lanthanoids

All lanthanoids are f-block elements, corresponding to the filling of the 4f electron shell

The lanthanoid series (Ln) is named after Lanthanum.

The trivial name "rare earths" is sometimes used to describe all the lanthanoids together with scandium and yttrium.

These elements are in fact fairly abundant in nature, although rare as compared to the "common" earths such as lime or magnesia. Cerium is the 26th most abundant element in the Earth's crust, neodymium is more abundant than gold and even thulium (the least common naturally-occurring lanthanoid) is more abundant than iodine.

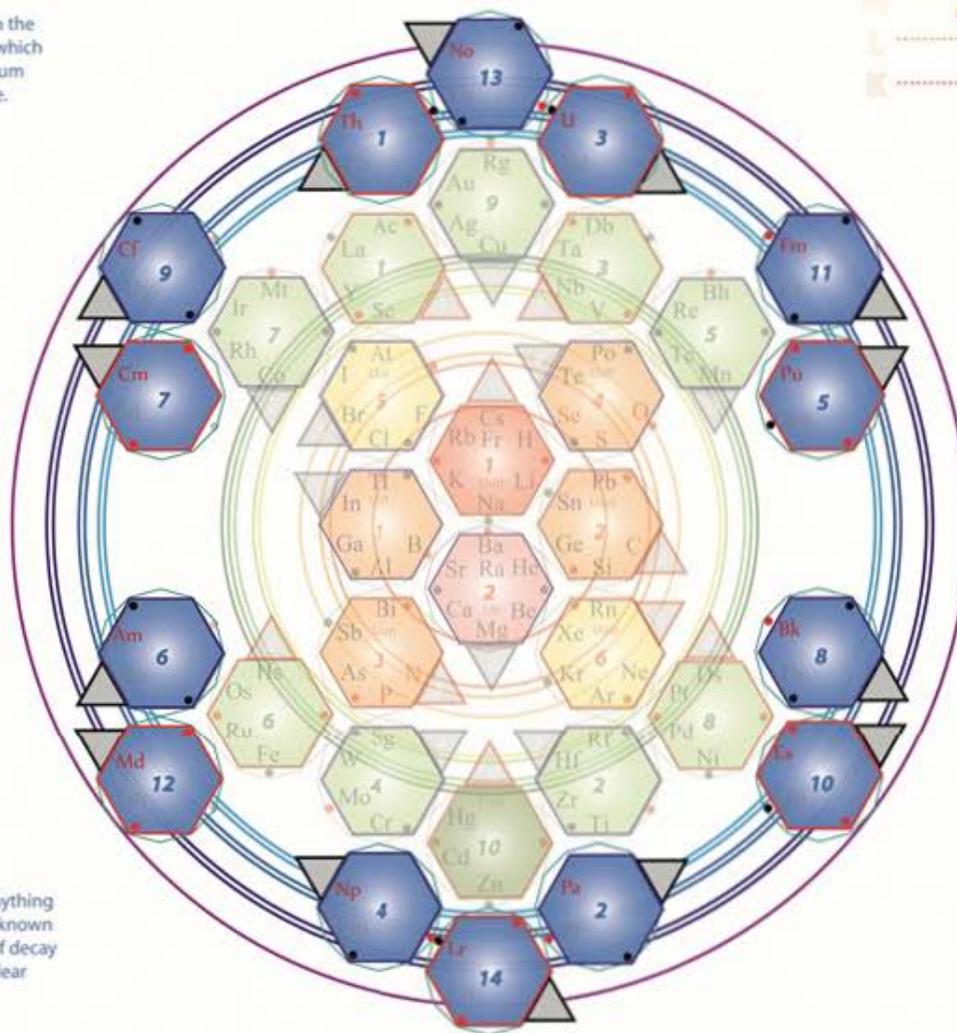
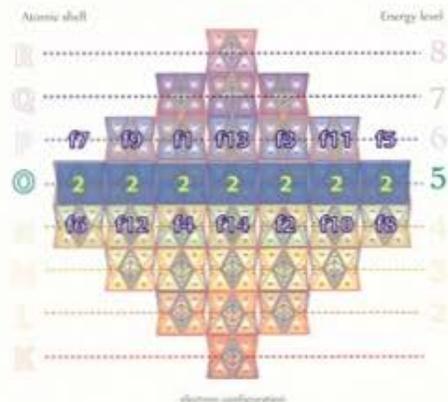


Actinoids

According to IUPAC nomenclature, the actinoid (previously actinide) series encompasses the 15 chemical elements that lie between actinium and lawrencium included on the periodic table, with atomic numbers 89 - 103.

The actinoid series derives its name from the first element in the series, actinium, and ultimately from the Greek ακτις (aktis), "ray," reflecting the elements' radioactivity.

The actinoids display less similarity in their chemical properties than the lanthanoid series (Ln), exhibiting a wider range of oxidation states, which initially led to confusion as to whether actinium, thorium, and uranium should be considered d-block elements. All actinoids are radioactive.



f 1-14 Actinoid



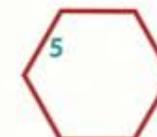
Shell Quantum level

7 f-Orbitals

n5

f1-14 sub-orbitals

14 Actinoids



Quantum level

Only thorium and uranium occur naturally in the earth's crust in anything more than trace quantities. Neptunium and plutonium have been known to show up naturally in trace amounts in uranium ores as a result of decay or bombardment. The remaining actinoids were discovered in nuclear fallout, or were synthesized in particle colliders.

The latter half of the series possess exceedingly short half-lives.

$$E = nh\nu$$

$$\sum_{K=25}^{R=32} \left[\overset{\text{Baryon rest masses}}{[72(n)^2]} + \overset{\text{lepton rest mass}}{[12e19]} + \overset{\text{KEM}}{[m_e v^2]} \right]_1^8$$

Deuterium mass-energy per shell

$$m = Ev^2/c^2$$

Periodic summation formula

re-termining the masses of the periodic summation formula into Planck energy quanta we can derive a quadratic formulation for the mass-energies of any periodic element

Baryon energies determine electron KEMs

$$h \sum_{K=25}^{R=32} \left[\overset{\text{Baryon rest mass-energy}}{[72(n^2)]} + \overset{\text{KEM}}{[v]} + \overset{\text{lepton rest mass-energy}}{[12e19]} \right]_1^8$$

Deuterium mass-energy per shell

electron rest mass-Matter is velocity invariant

quadratic PΣ formulation

$$\bar{n} = 1e19v$$

this quadratic form can be again re-organised to better reflect the specific rest mass-energy contributions of Baryons, electrons & their KEM fields to the molar mass-energy-Matter of any specific element

atomic shell energies

$$\sum_{K=25}^{R=32} \left[\overset{\text{Baryon rest quanta}}{[72(n^2)]} + \overset{\text{lepton rest quanta}}{[12e19]} + \overset{\text{KEM}}{[\Delta v]} \right]_1^8$$

nuclear mass-energy quanta per shell

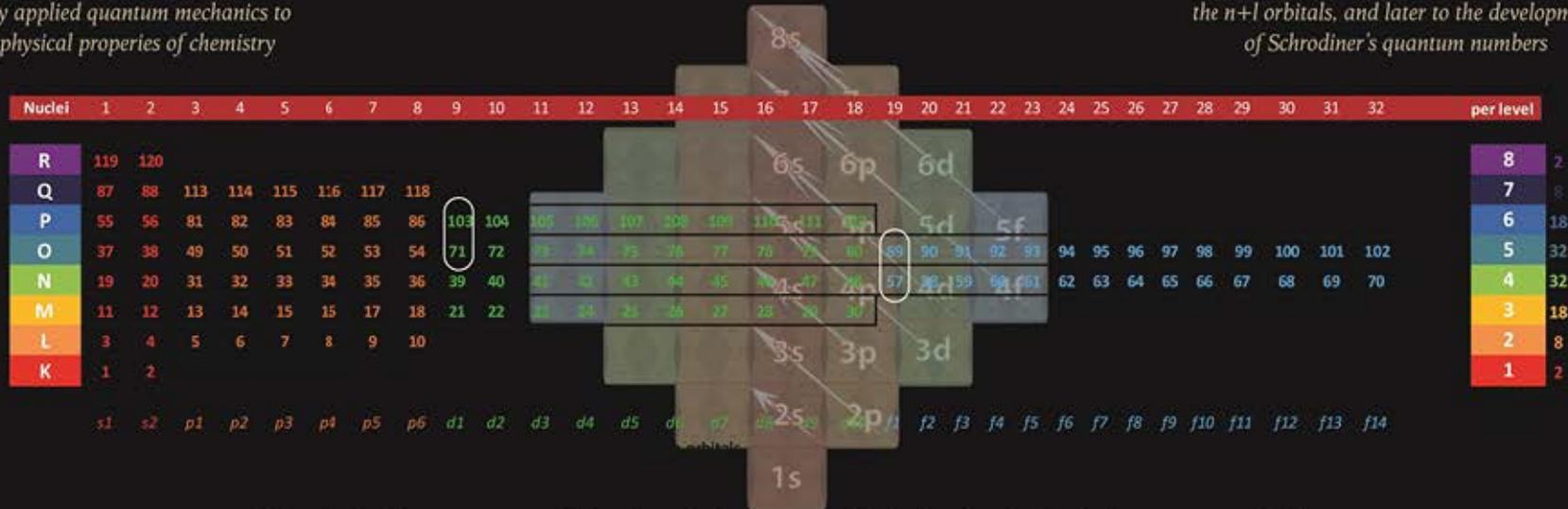
spectral line transitions

Elementary PΣ formulation

aufbau filling principle

The aufbau principle was developed by Neils Bohr and Wolfgang Pauli in 1920 as they applied quantum mechanics to the physical properties of chemistry

It attempted to model the properties of electrons in atoms and led to the introduction of the $n+1$ orbitals, and later to the development of Schrodiner's quantum numbers

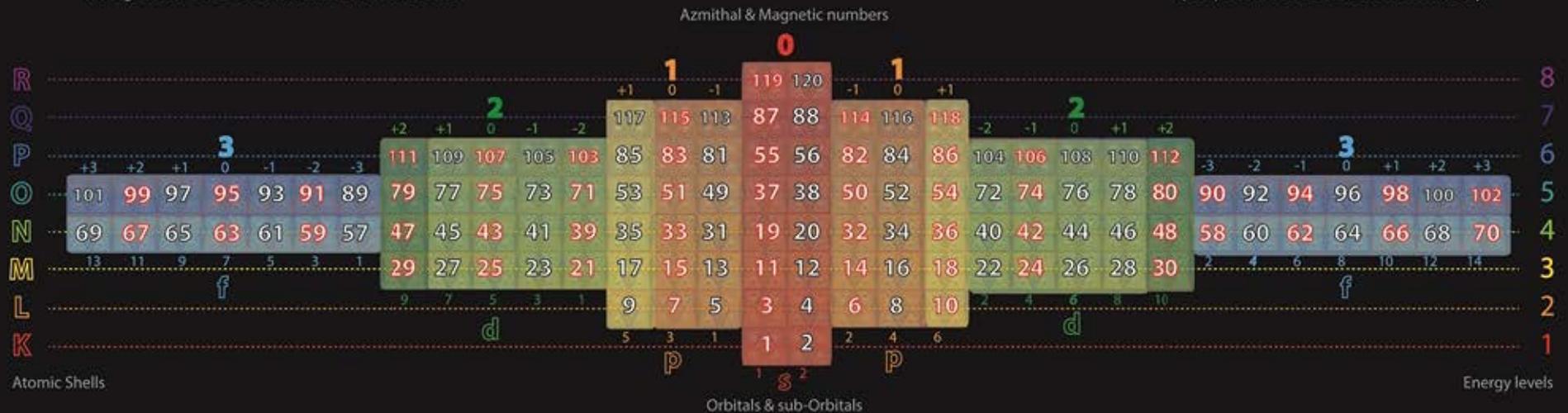


"The orbitals of lower energy are filled in first with the electrons and only then the orbitals of higher energy are filled."
While succesful in describing lower numbered elements, many anomalous configurations arise from it in the d & f electron orbitals that need to be corrected

Tetryonic orbital filling

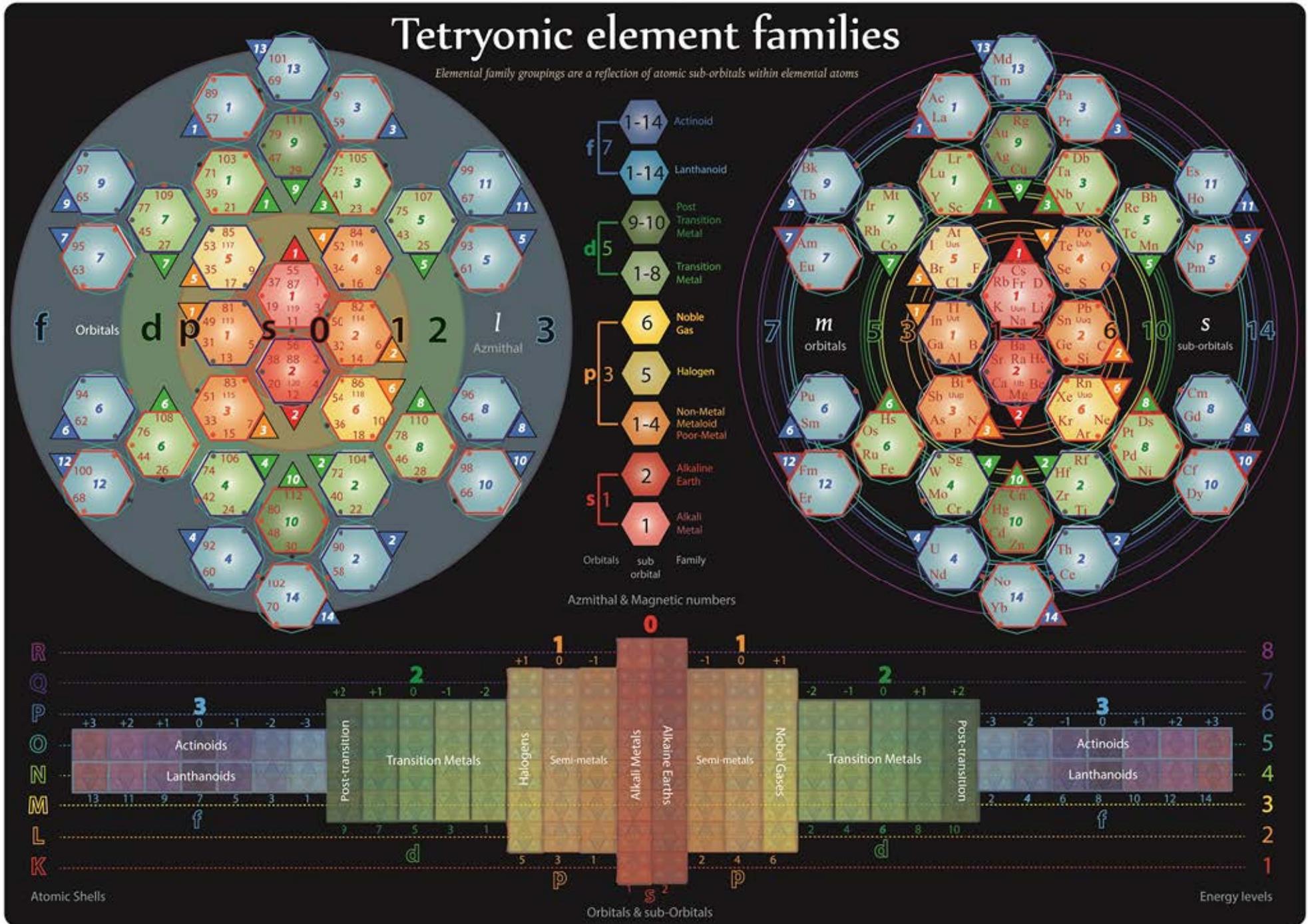
Tetryonic theory refines the aufbau principle by correcting it to follow the true quantum filling order of Deuterium nuclei in atoms

This then allows for all elementary nuclei, their atomic configurations & quantum properties to be modeled exactly



Tetryonic element families

Elemental family groupings are a reflection of atomic sub-orbitals within elemental atoms



Tetryonics 52.15 - Tetryonic elemental families

elemental family geometry



electron configuration



Hydrogen is NOT a periodic table element

Hydrogen

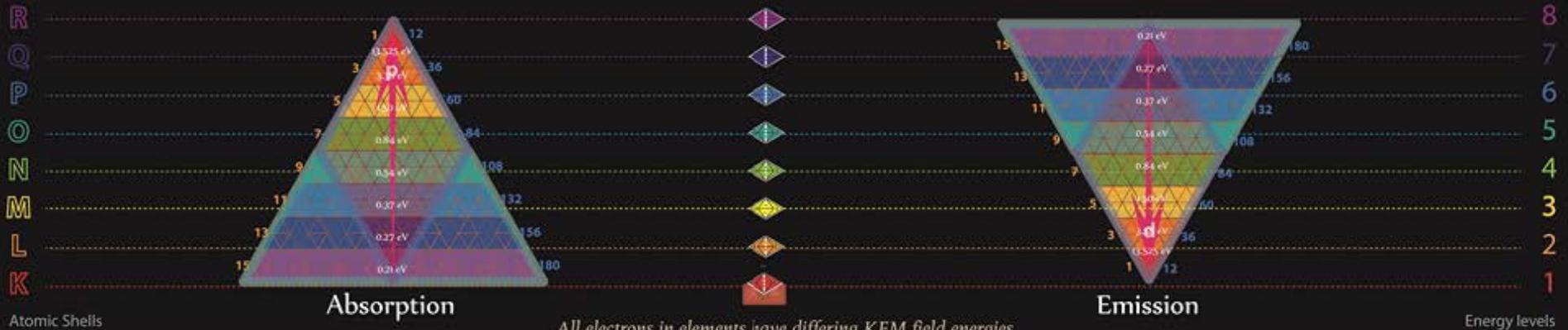
Baryonic energy levels determine photo-electron KEM field energies

$$\sum_{K=25}^P \left[\overset{\text{Baryon rest quanta}}{72(m^2)} + \overset{\text{lepton rest quanta}}{12e19} + \overset{\text{KEM}}{\Delta v} \right]_i^8$$

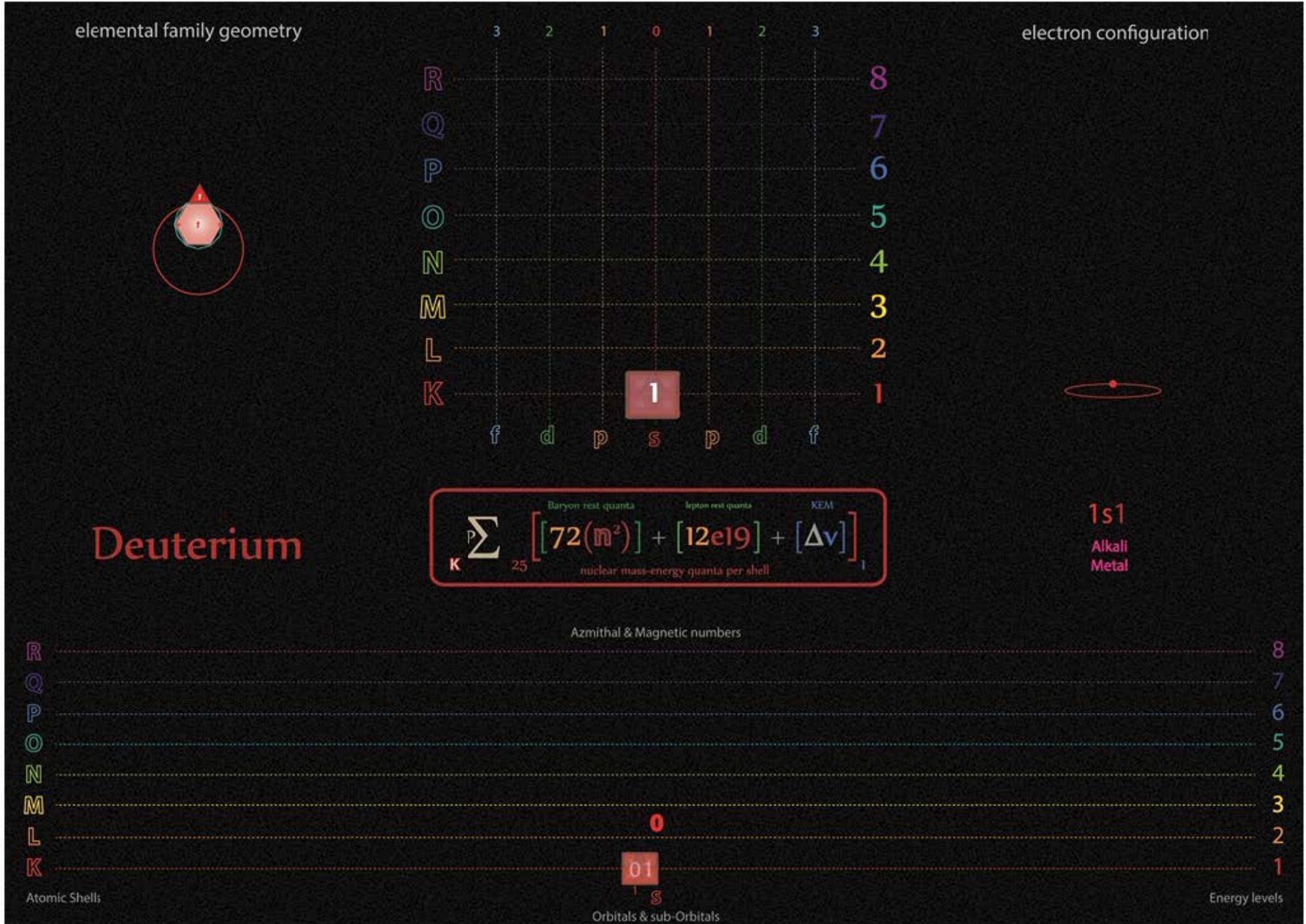
nuclear mass-energy quanta per shell

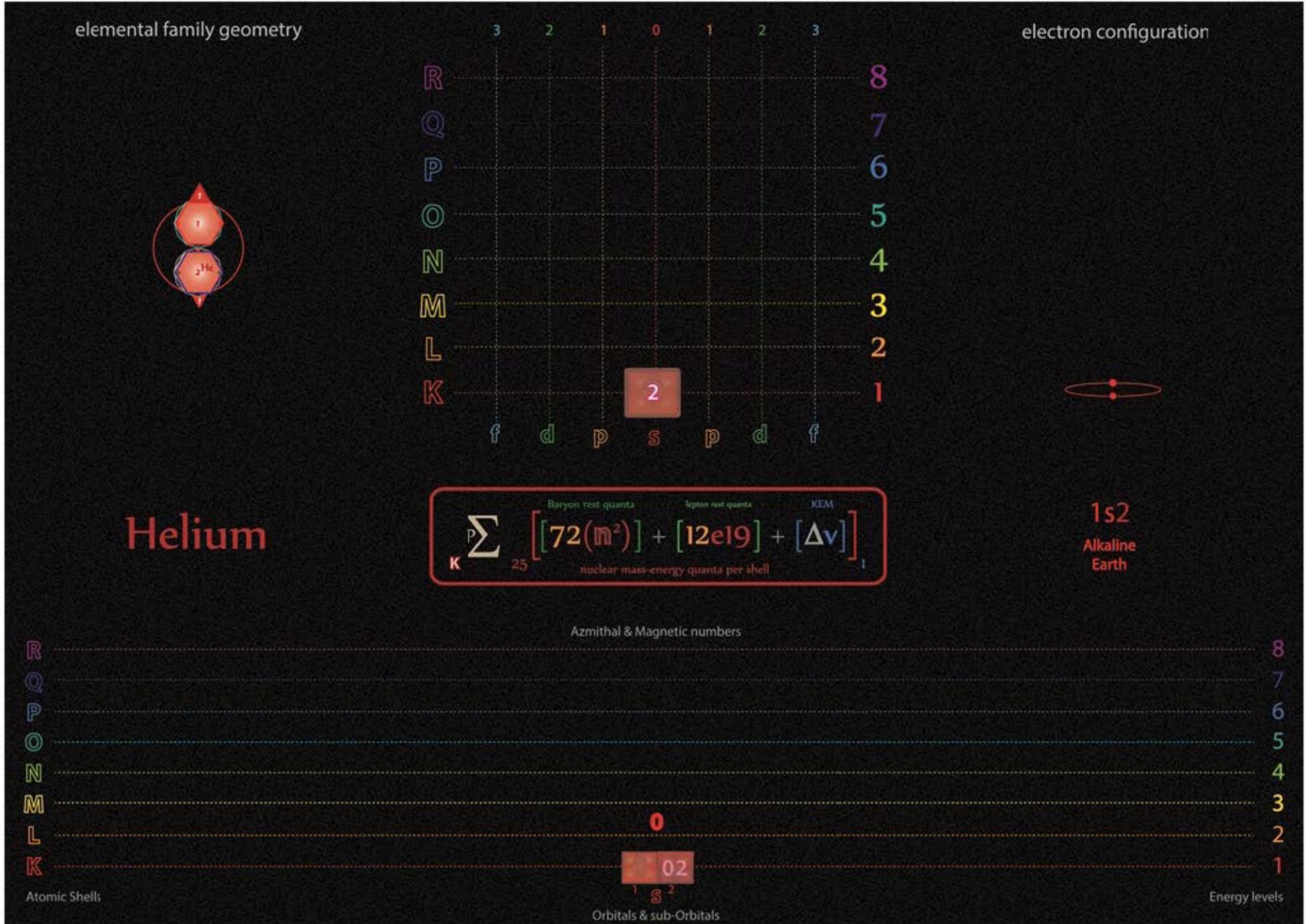
Free Radical element

accelerating photo-electrons produce spectral lines

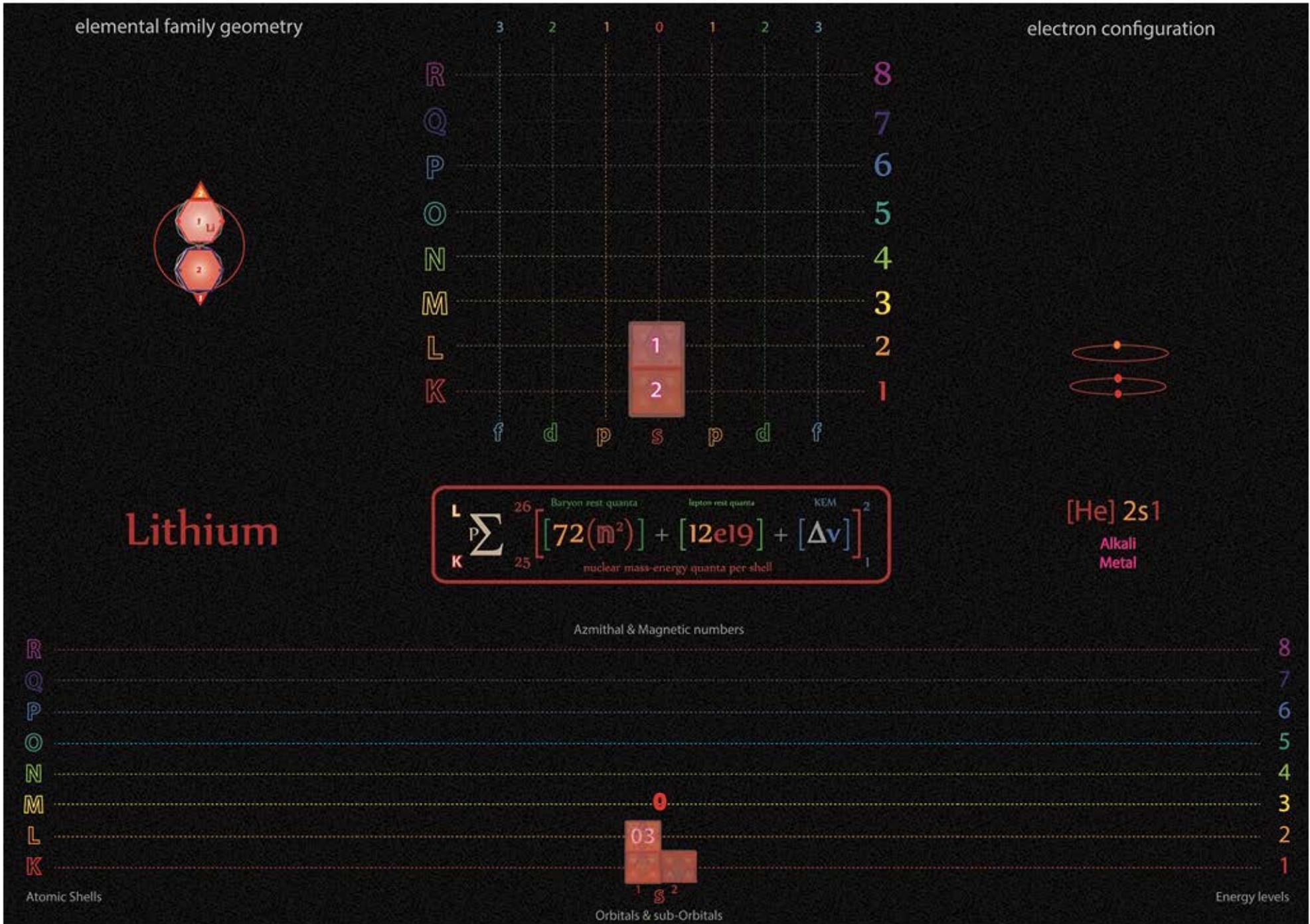


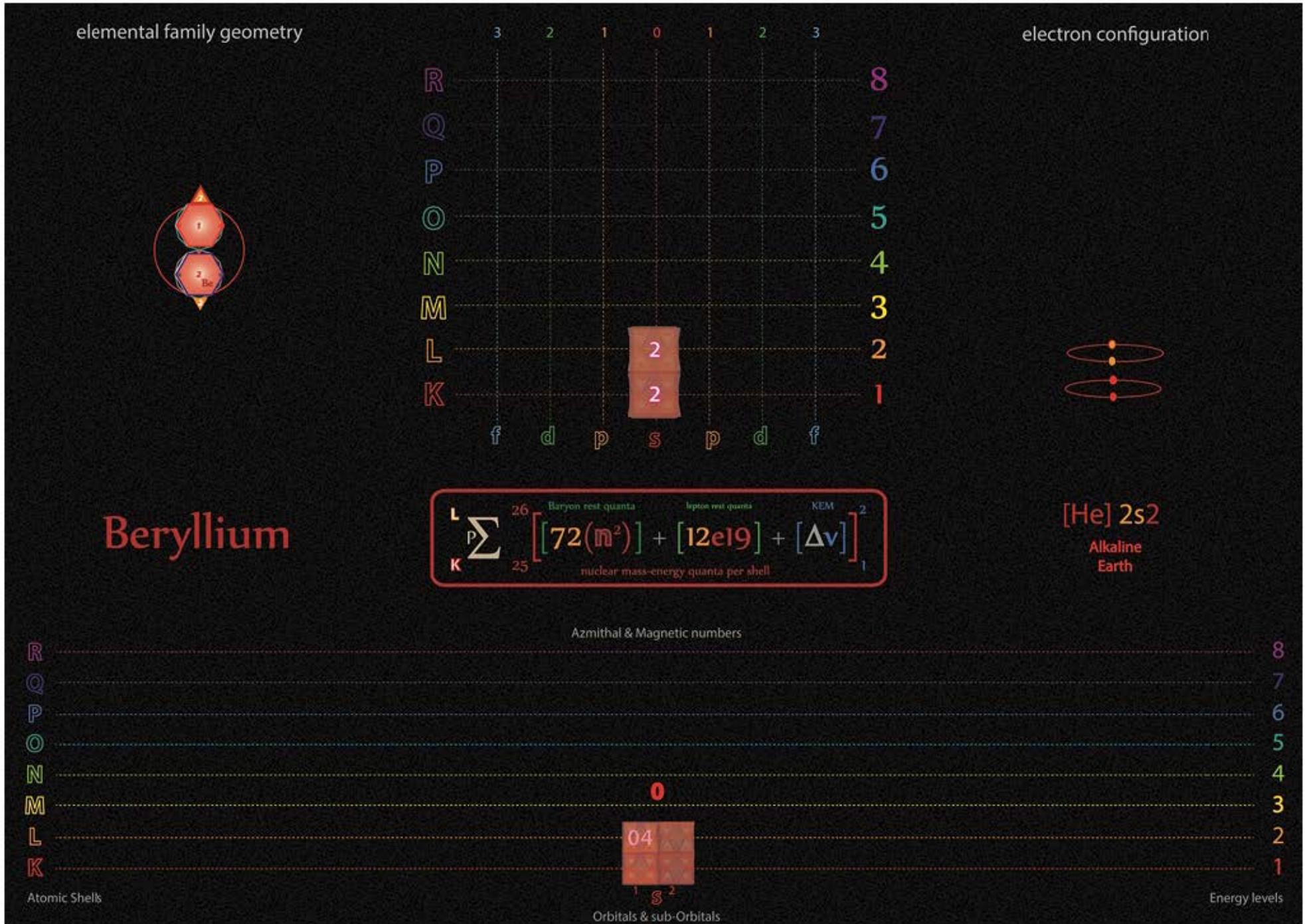
All electrons in elements have differing KEM field energies



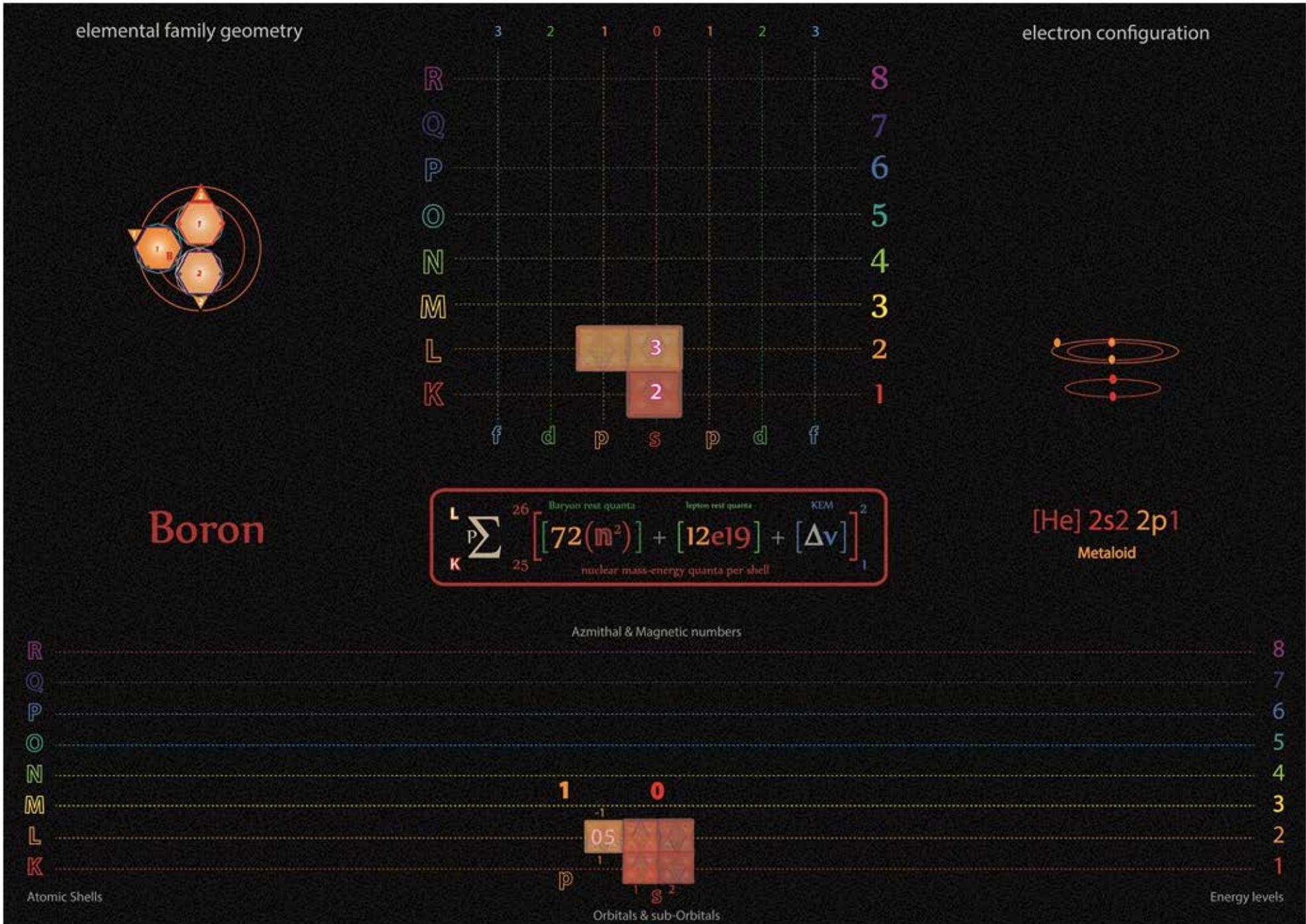


Tetryonics 53.02 - Helium atomic config

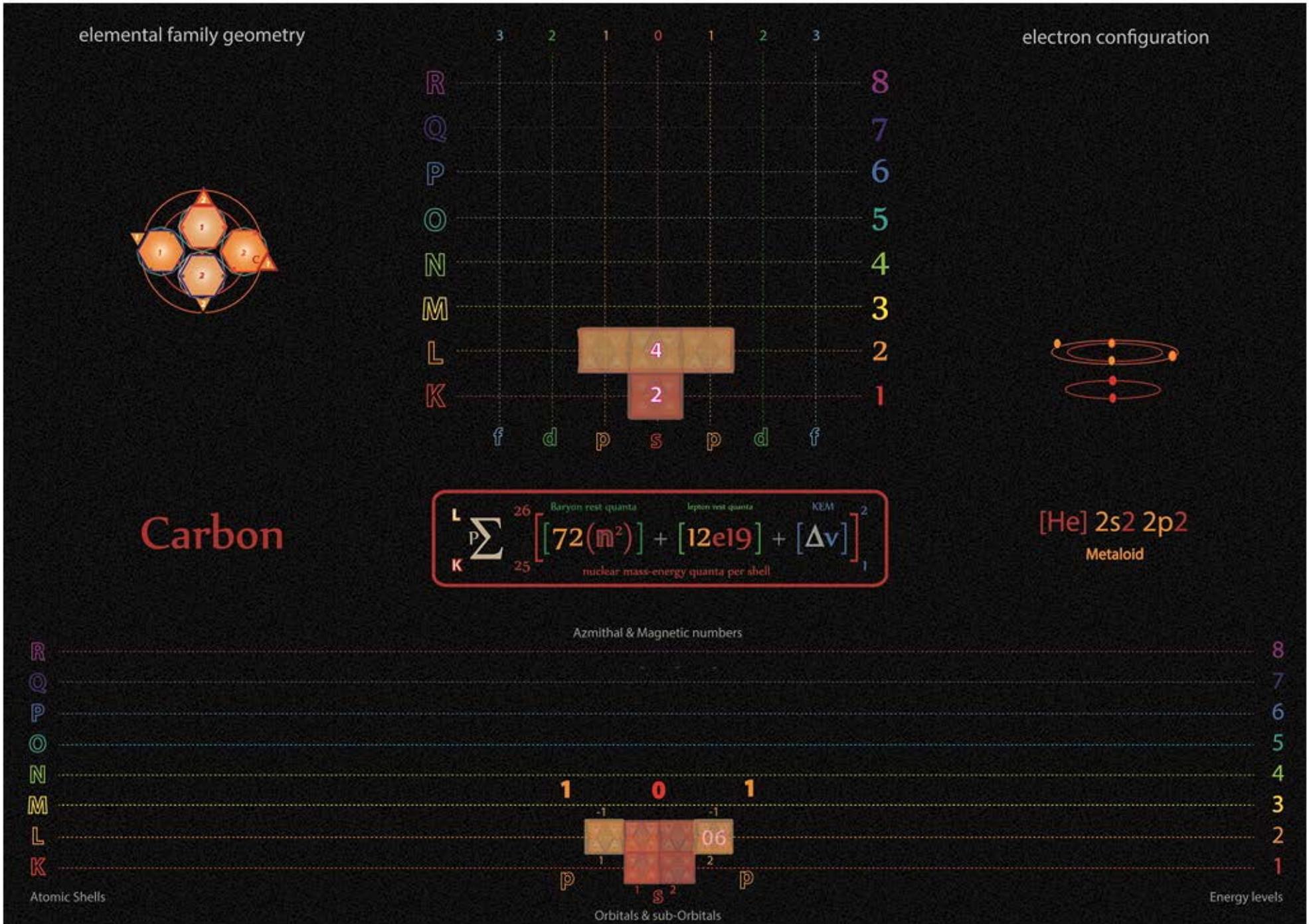




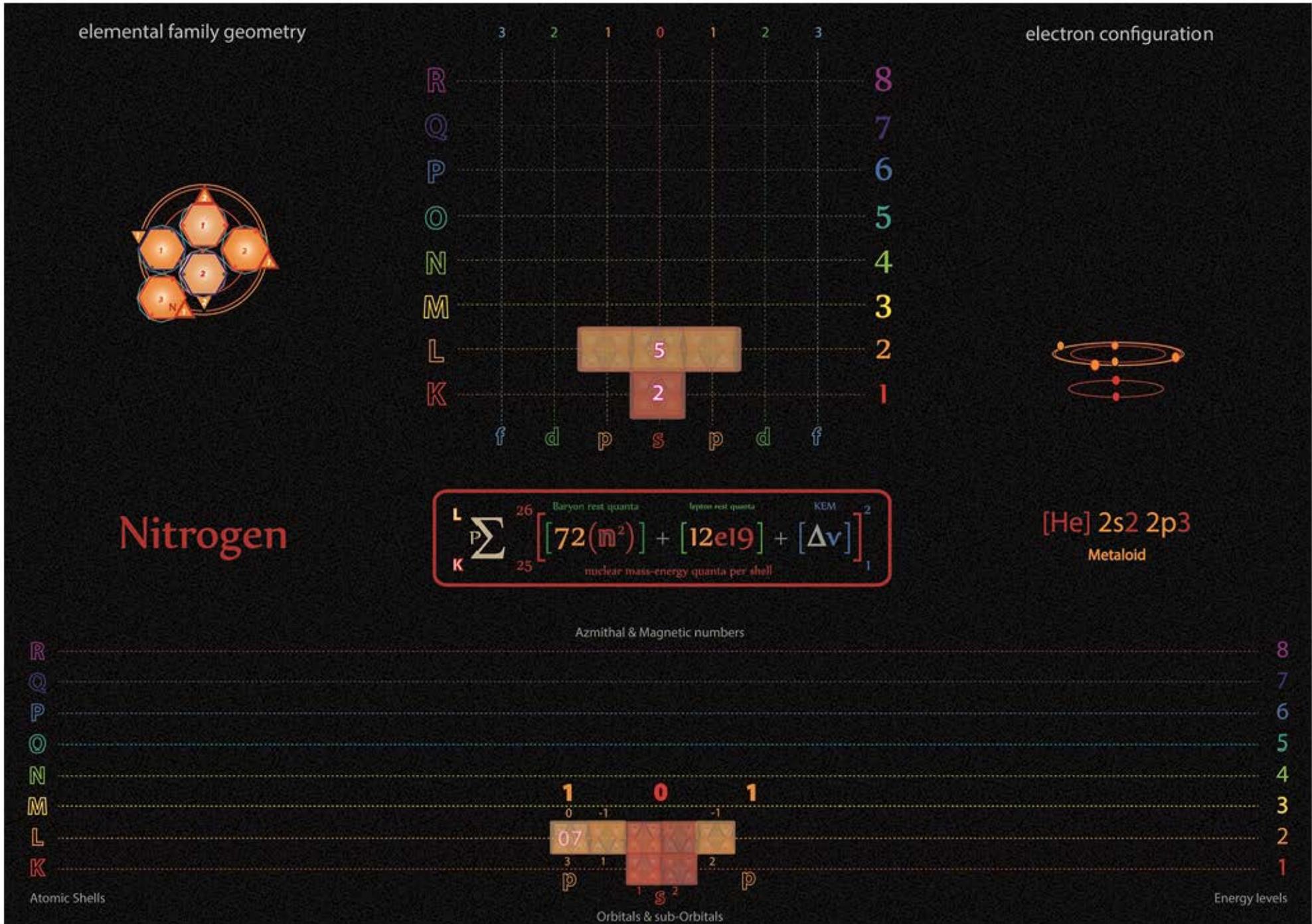
Tetryonics 53.04 - Beryllium atomic config



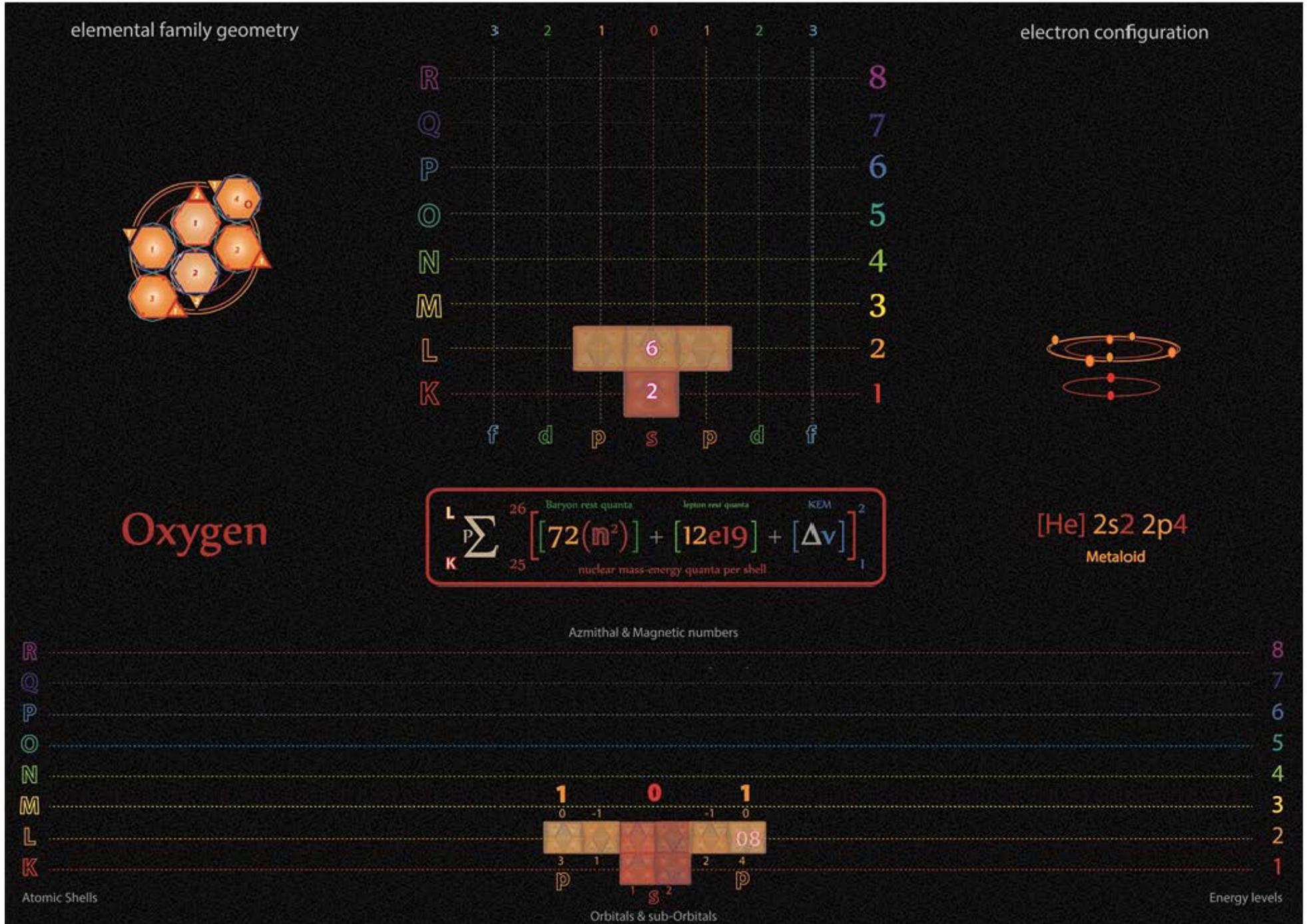
Tetryonics 53.05 - Boron atomic config



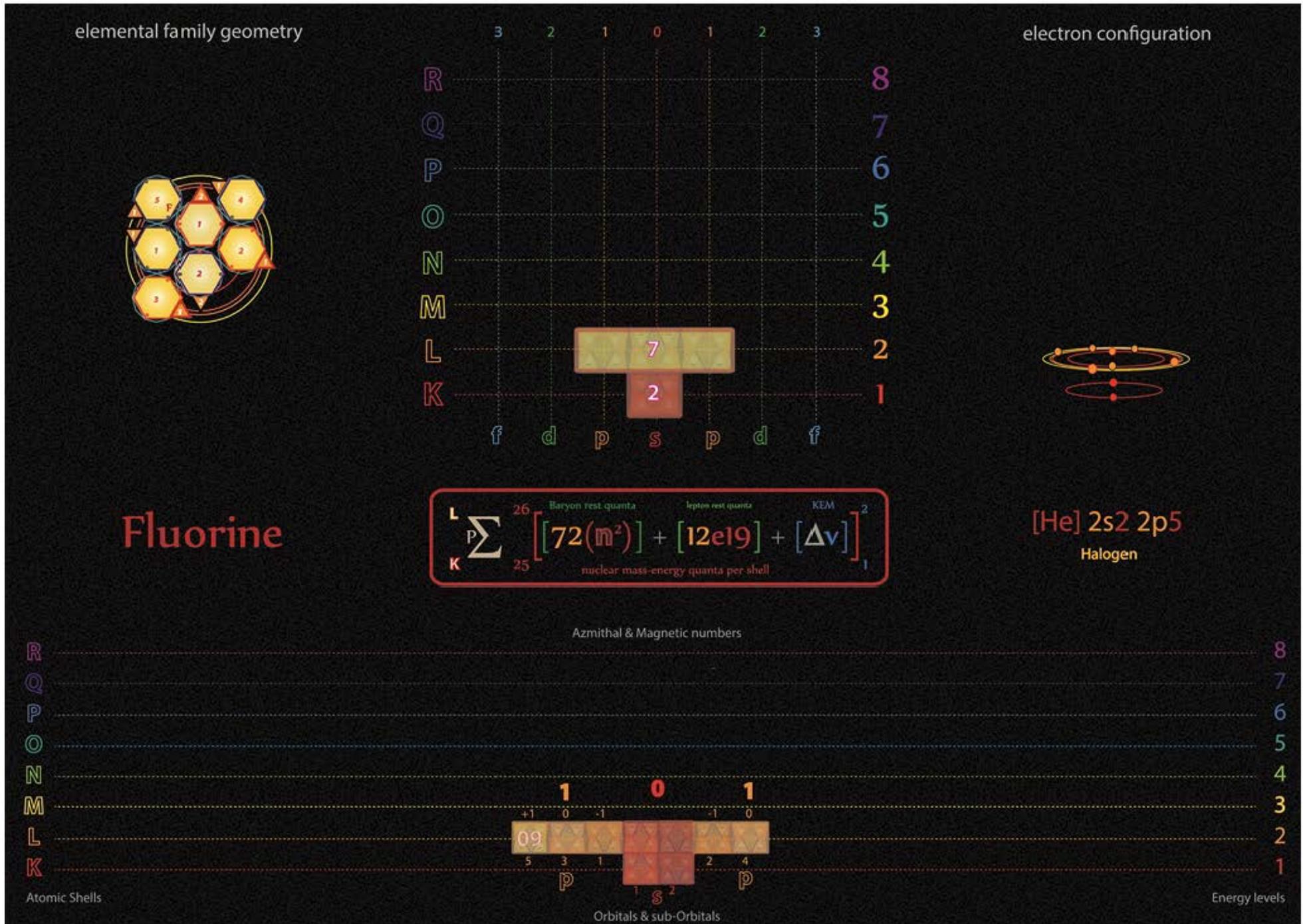
Tetryonics 53.06 - Carbon atomic config



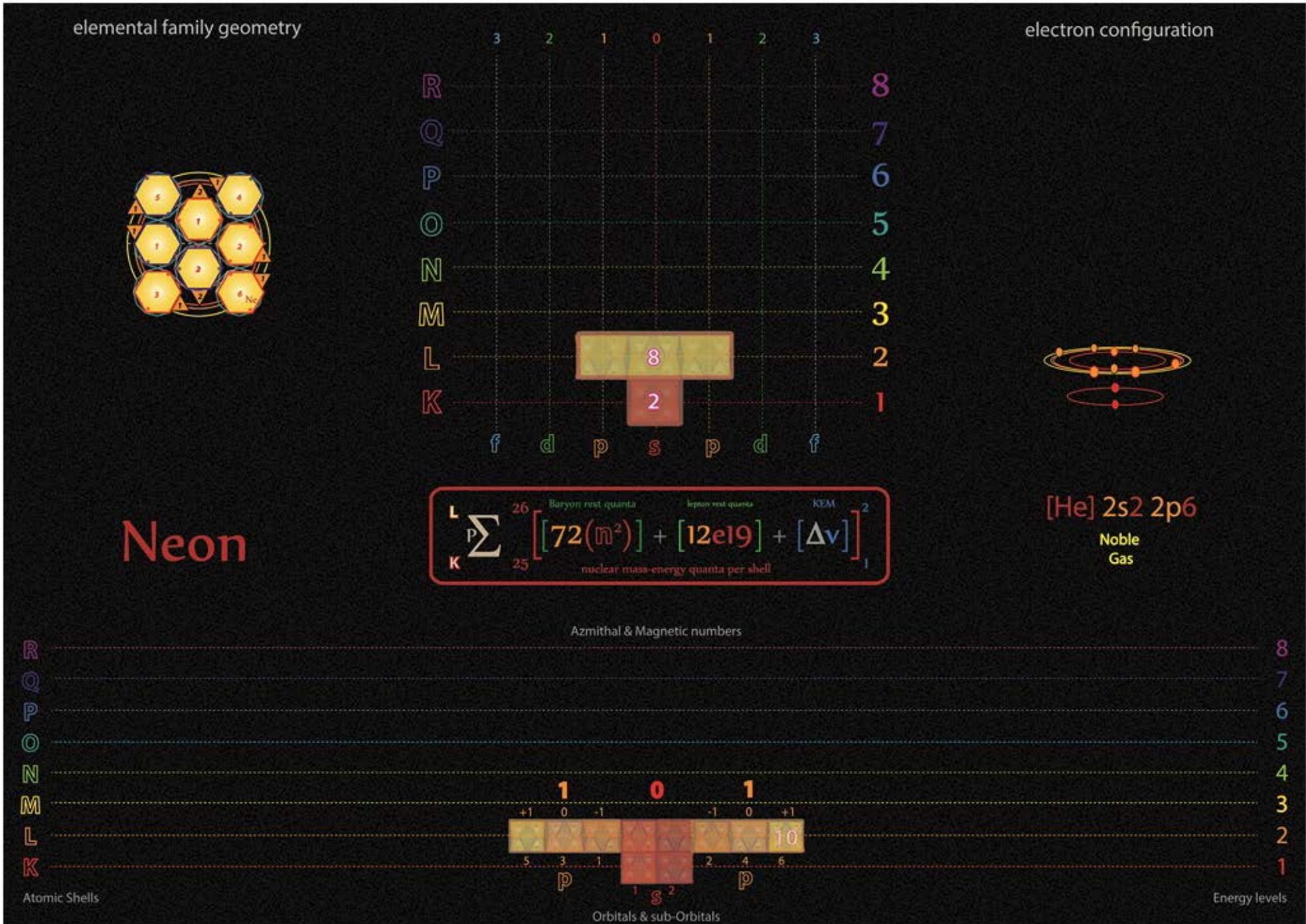
Tetryonics 53.07 - Nitrogen atomic config



Tetryonics 53.08 - Oxygen atomic config



Tetryonics 53.09 - Fluorine atomic config

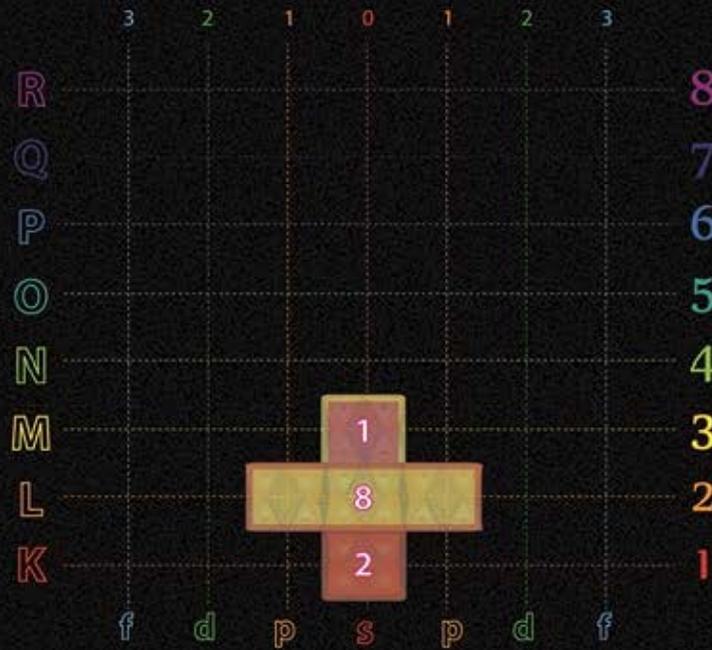
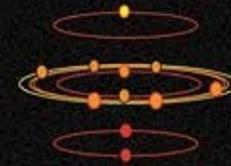


Tetryonics 53.10 - Neon atomic config

elemental family geometry



electron configuration



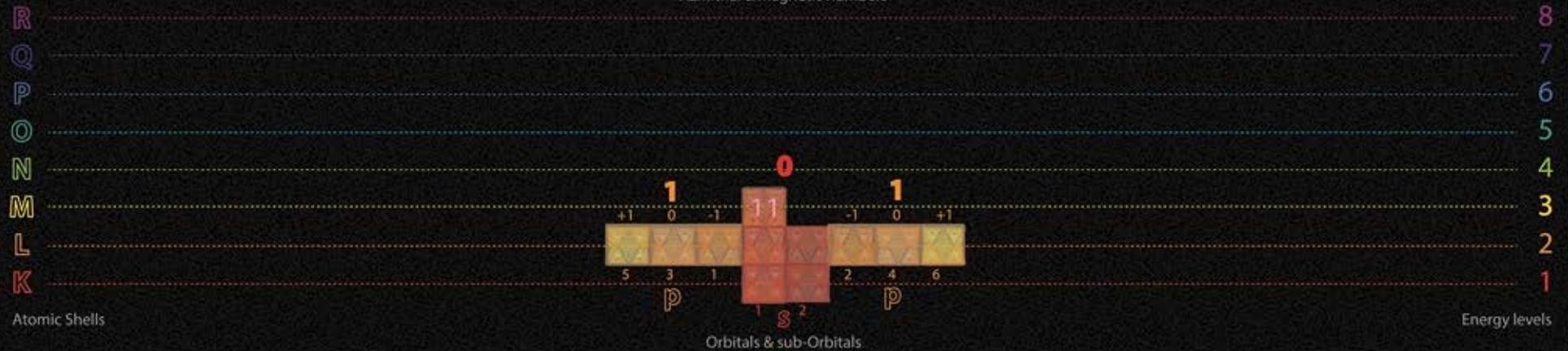
Sodium

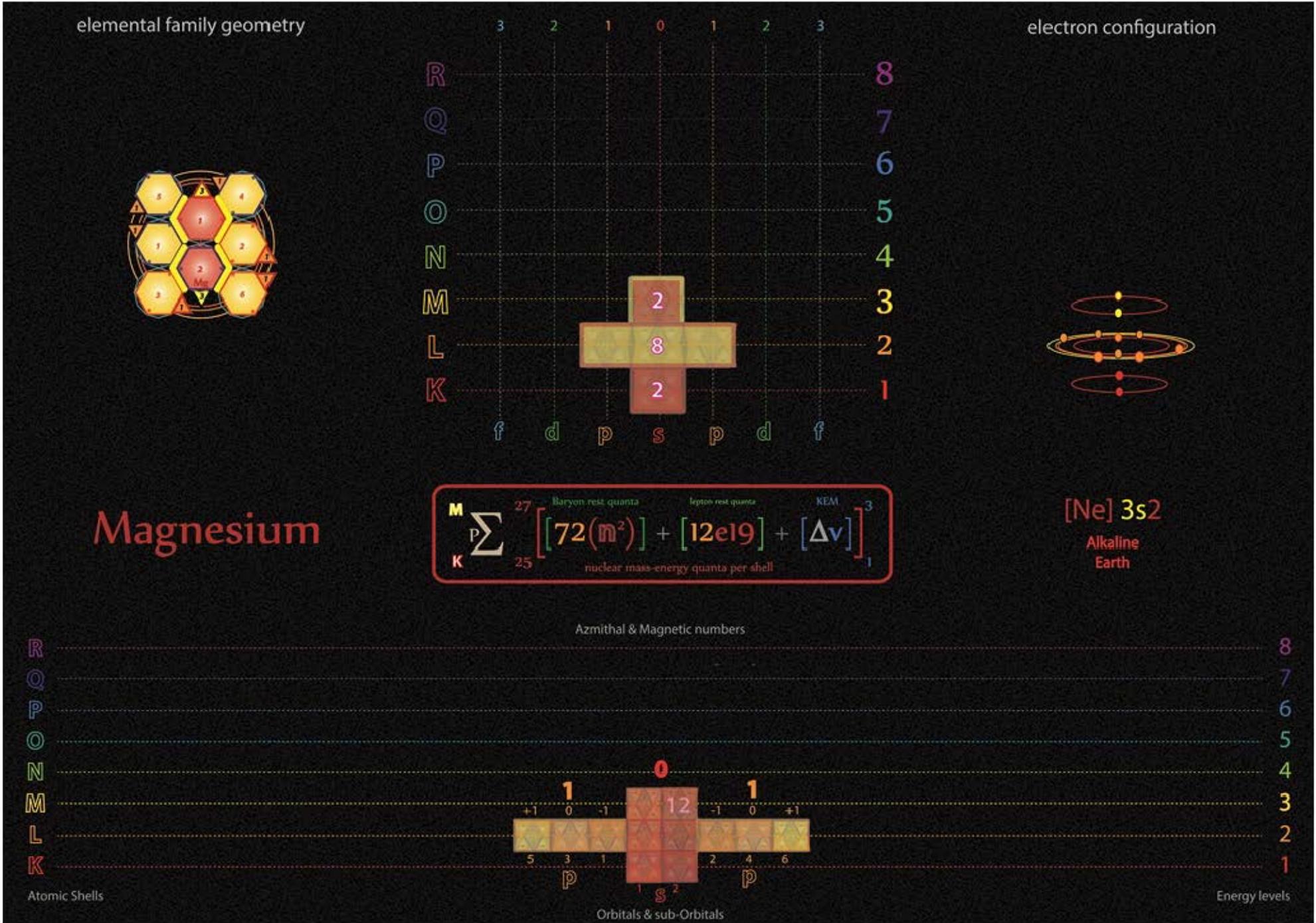
$$\begin{matrix}
 M \\
 P \\
 K
 \end{matrix}
 \sum_{25}^{27} \left[\overset{\text{Baryon rest quanta}}{72(m^2)} + \overset{\text{lepton rest quanta}}{12e19} + \overset{\text{KEM}}{[\Delta v]} \right]_1^3$$

nuclear mass-energy quanta per shell

[Ne] 3s1
Alkali Metal

Azimuthal & Magnetic numbers



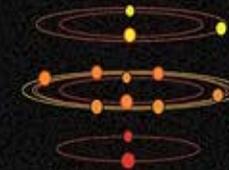


Tetryonics 53.12 - Magnesium atomic config

elemental family geometry



electron configuration



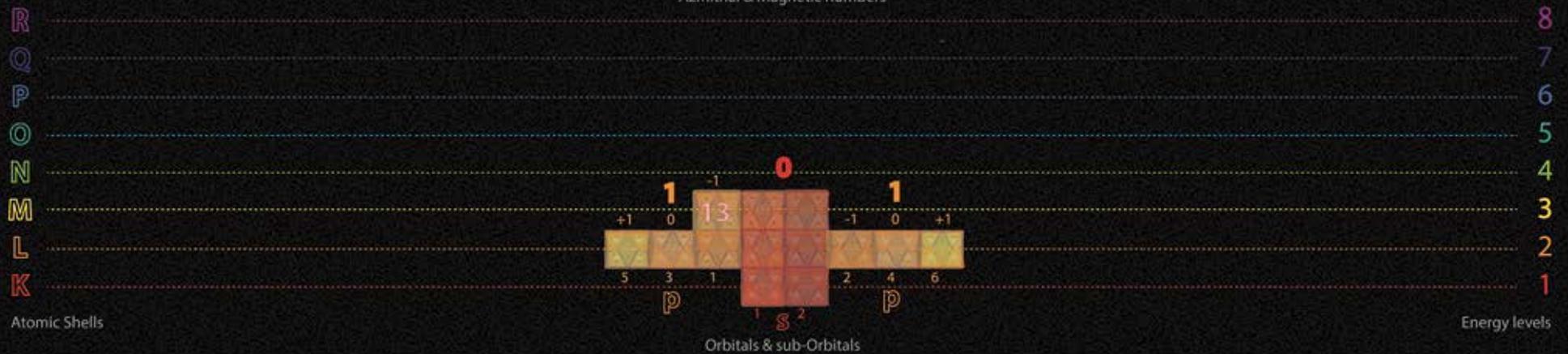
Aluminium

$$\sum_{K=25}^{M=27} \left[\overset{\text{Baryon rest quanta}}{72(m^2)} + \overset{\text{lepton rest quanta}}{12e19} + \overset{\text{KEM}}{[\Delta v]} \right]_1^3$$

nuclear mass-energy quanta per shell

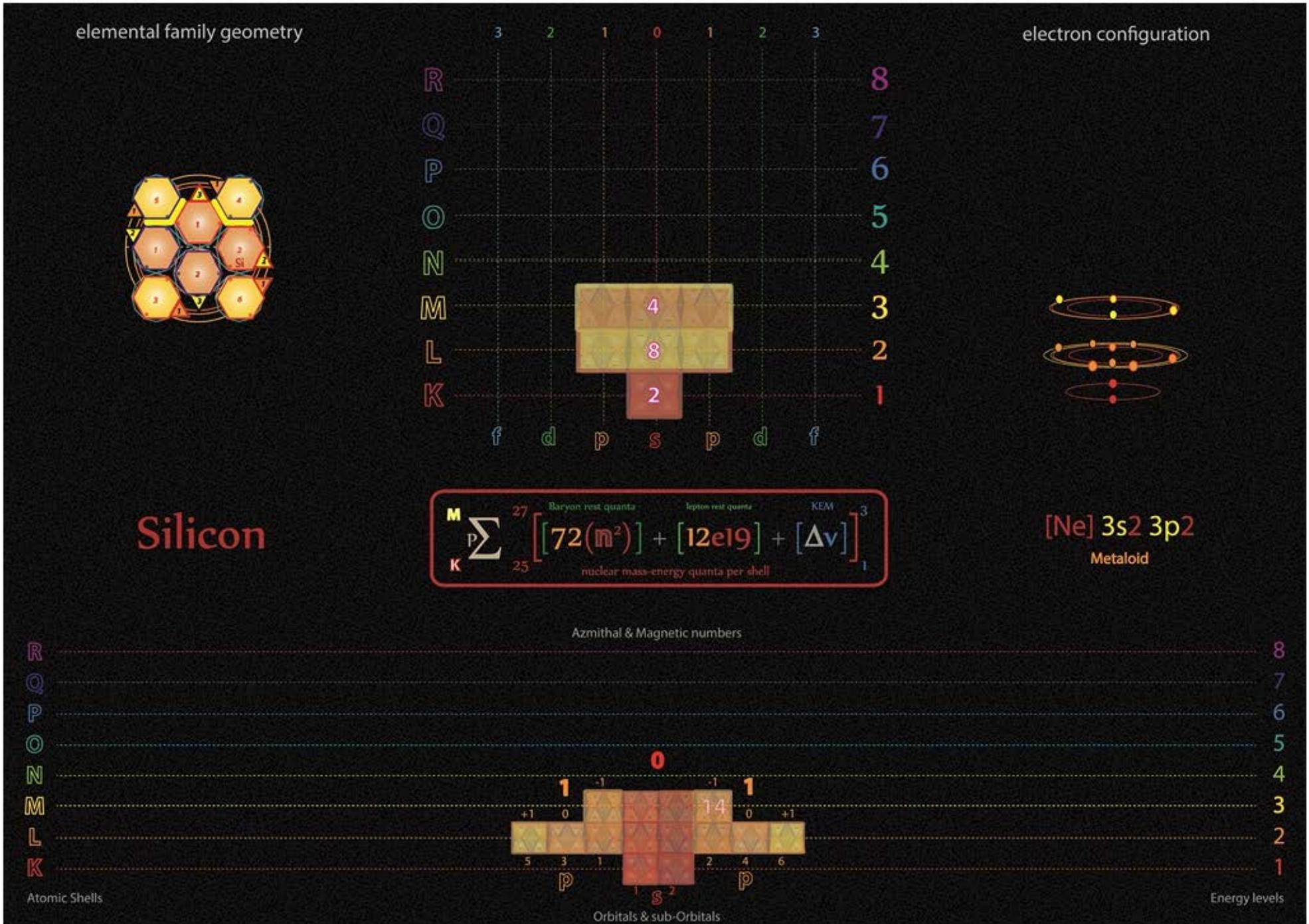
[Ne] 3s² 3p¹
Metalloid

Azimuthal & Magnetic numbers



Atomic Shells

Energy levels



Tetryonics 53.14 - Silicon atomic config

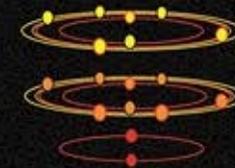
elemental family geometry



Chlorine



electron configuration

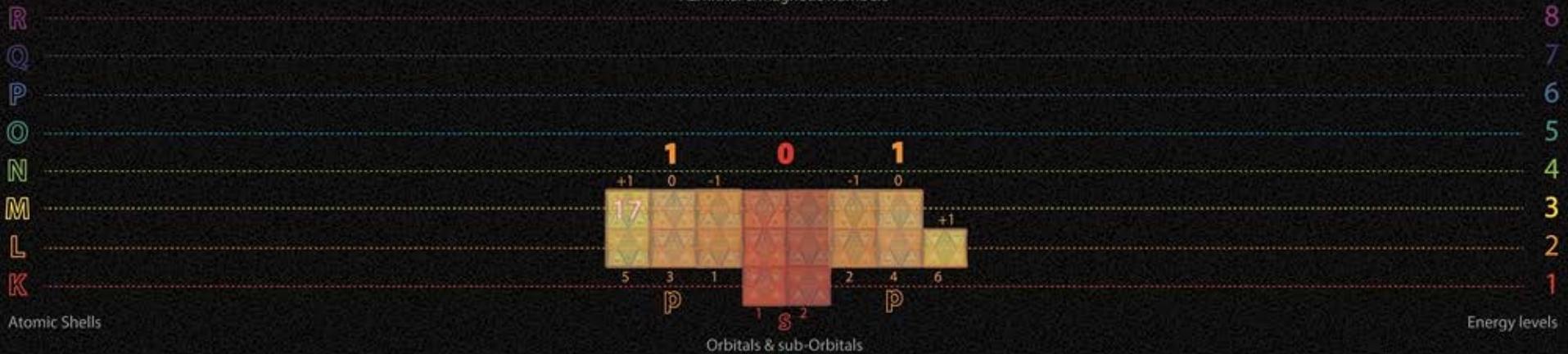


$$\begin{matrix} \text{M} \\ \text{P} \\ \text{K} \end{matrix} \sum_{25}^{27} \left[\overset{\text{Baryon rest quanta}}{72(m^2)} + \overset{\text{lepton rest quanta}}{12e19} + \overset{\text{KEM}}{[\Delta v]} \right]_1^3$$

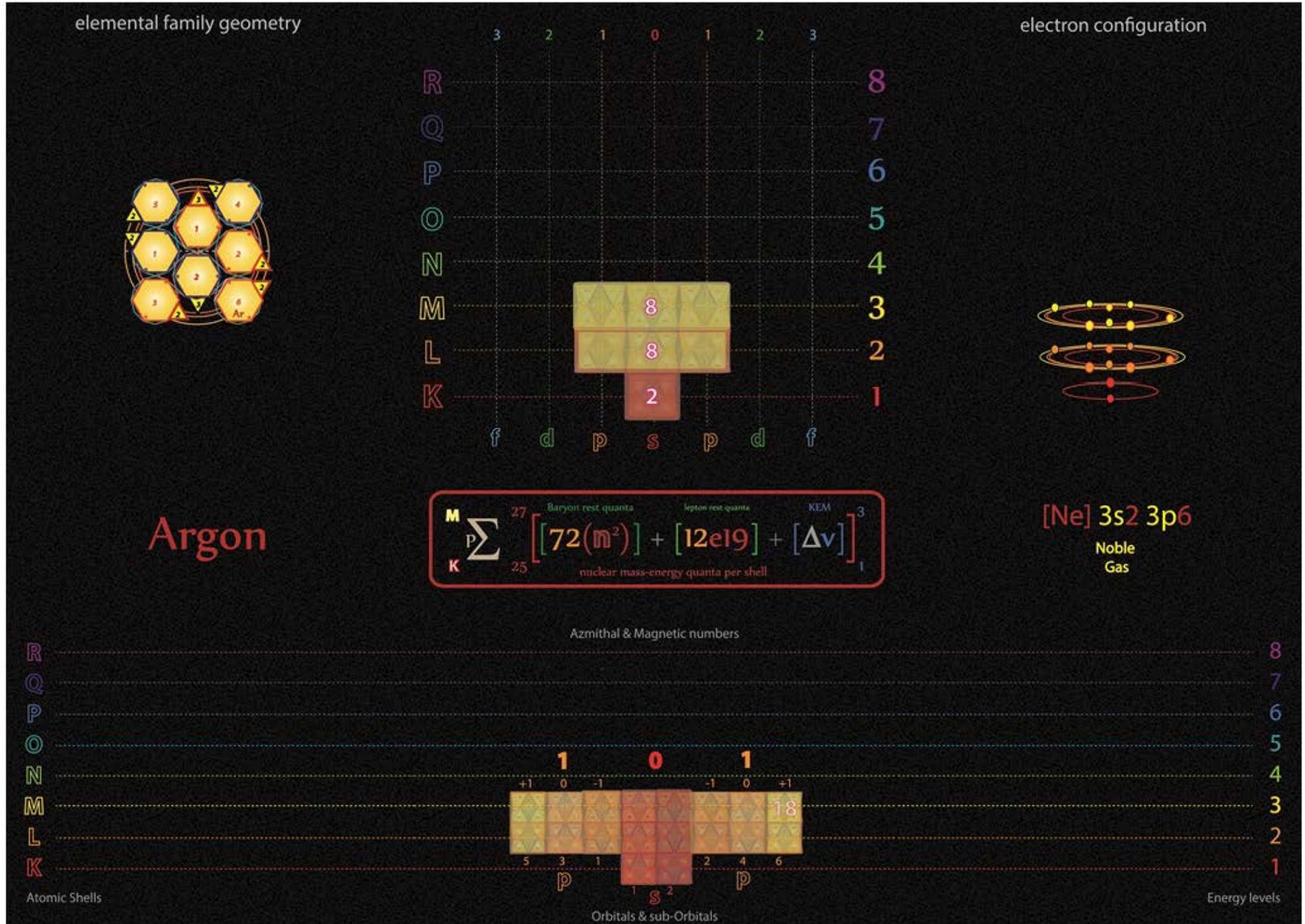
nuclear mass-energy quanta per shell

[Ne] 3s² 3p⁵
Halogen

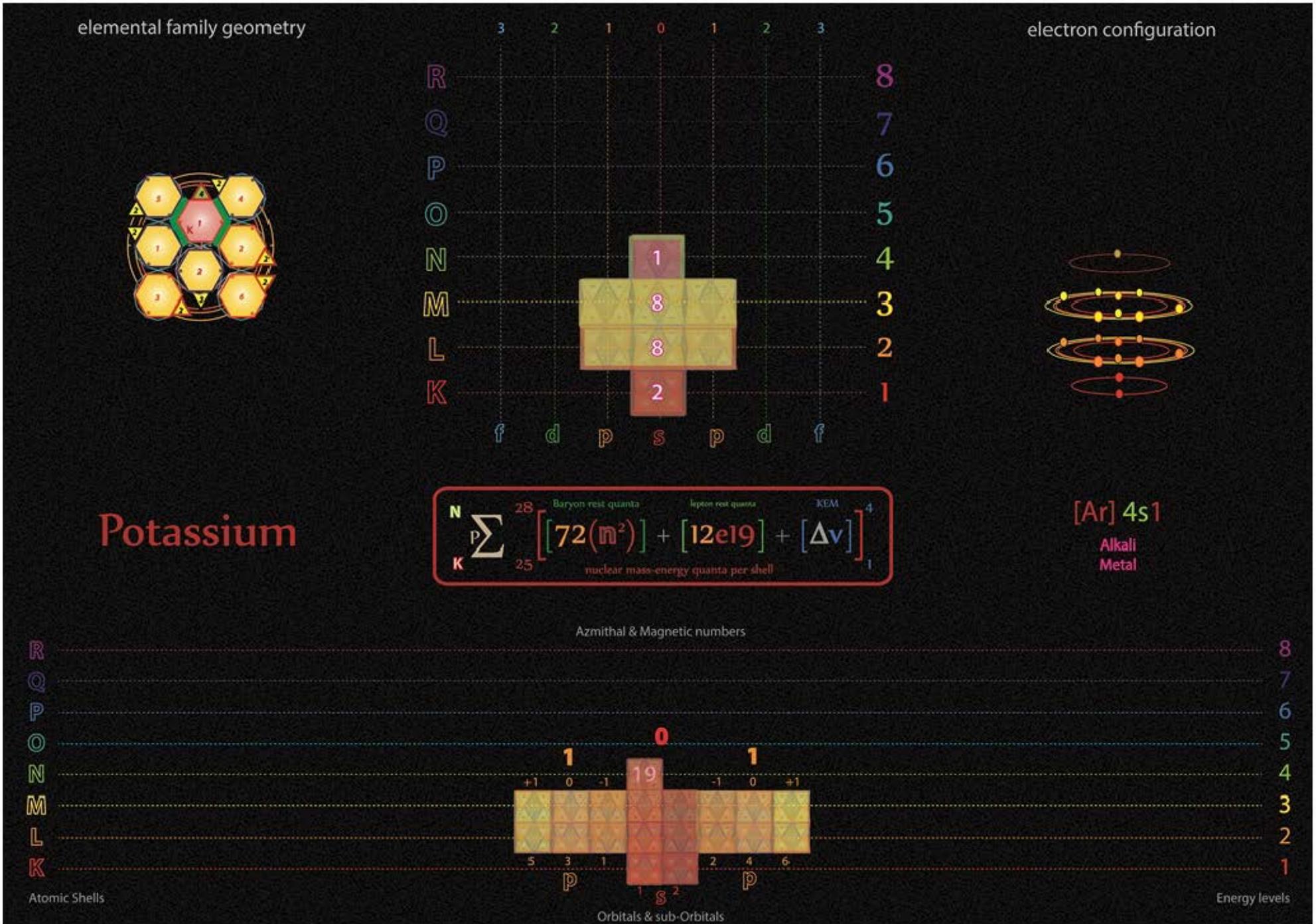
Azimuthal & Magnetic numbers



Tetryonics 53.17 - Chlorine atomic config



Tetryonics 53.18 - Argon atomic config

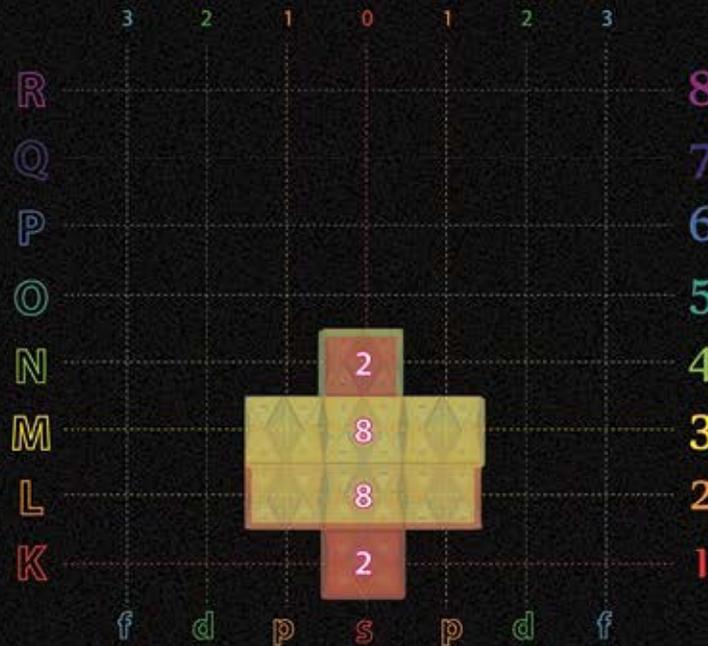
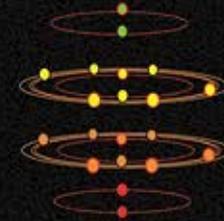


Tetryonics 53.19 - Potassium atomic config

elemental family geometry



electron configuration



Calcium

$$N \sum_{K=25}^{28} \left[\overset{\text{Baryon rest quanta}}{72(m^2)} + \overset{\text{lepton rest quanta}}{12e19} + \overset{\text{KEM}}{[\Delta v]} \right]_1^4$$

nuclear mass-energy quanta per shell.

[Ar] 4s2
Alkaline Earth

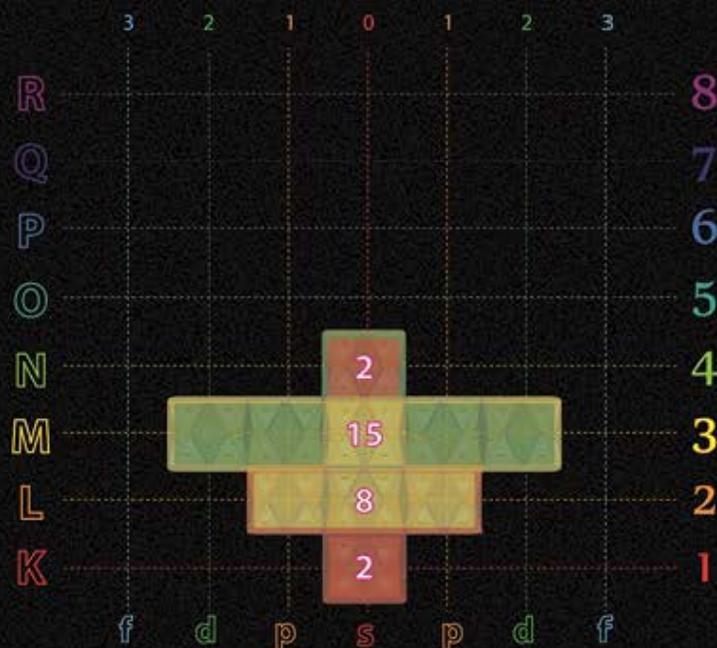
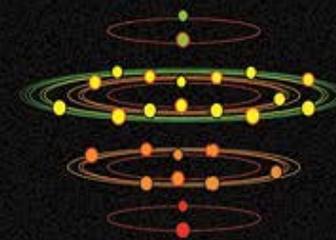
Azimuthal & Magnetic numbers



elemental family geometry



electron configuration



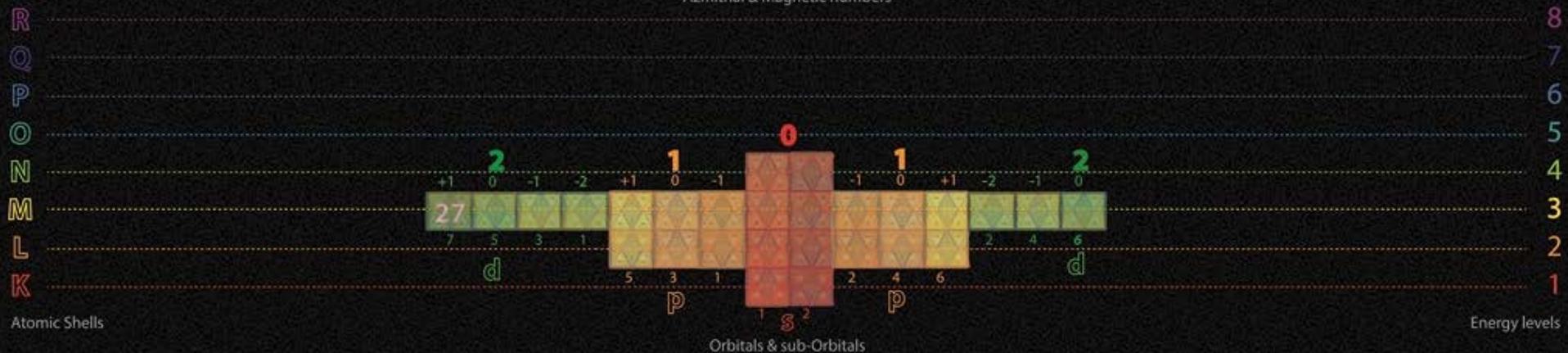
Cobalt

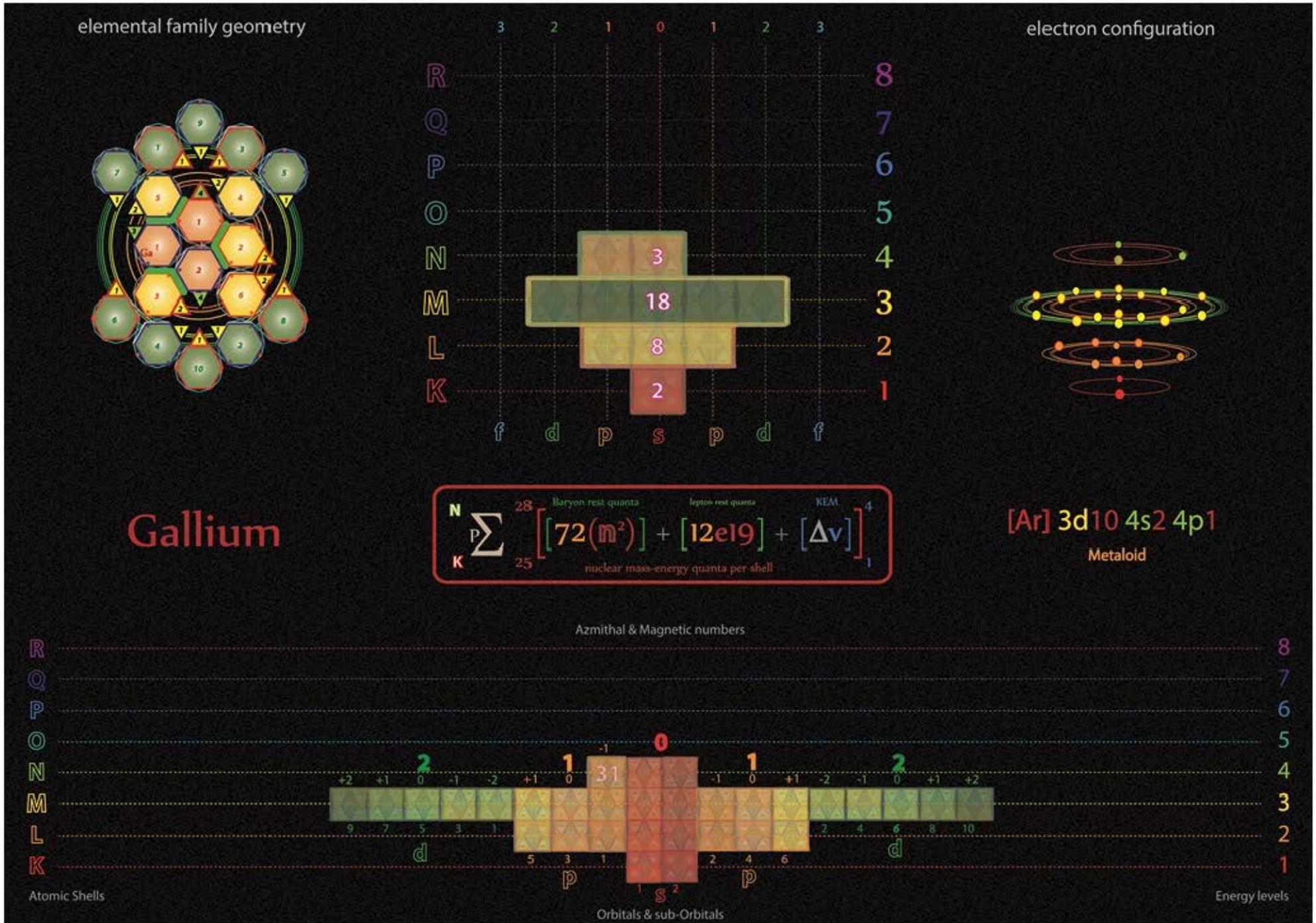
$${}^N_P \sum_K^{28} \left[72(m^2) \right] + \left[12e19 \right] + \left[\Delta v \right]_1^4$$

Baryon rest quanta Lepton rest quanta KEM
nuclear mass-energy quanta per shell

[Ar] 3d⁷ 4s²
Transition Metal

Azimuthal & Magnetic numbers



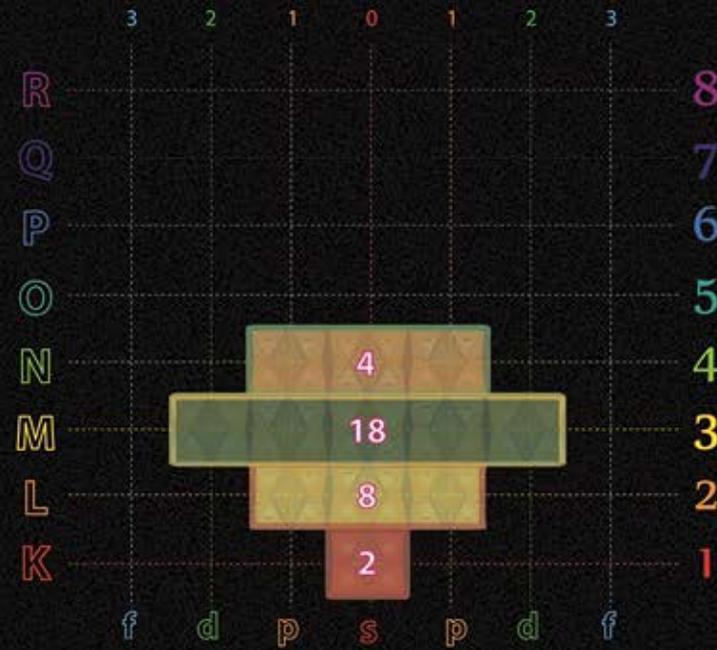
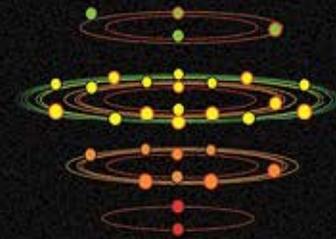


Tetryonics 53.31 - Gallium atomic config

elemental family geometry



electron configuration

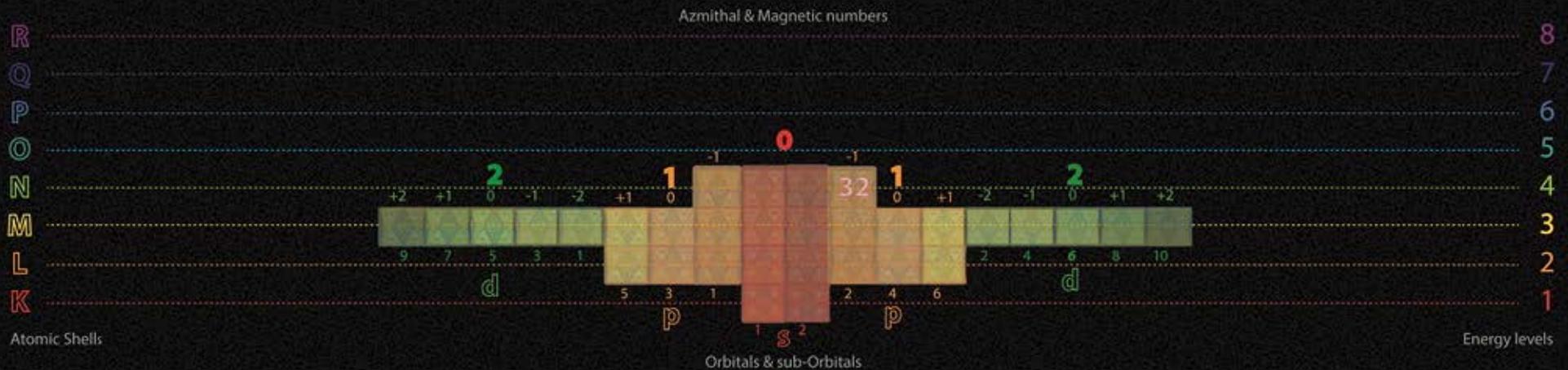


Germanium

$${}^N_P \sum_K^{28} \left[\overset{\text{Baryon rest quanta}}{72(m^2)} + \overset{\text{lepton rest quanta}}{12e19} + \overset{\text{KEM}}{[\Delta v]} \right]_1^4$$

nuclear mass-energy quanta per shell

[Ar] 3d¹⁰ 4s² 4p²
Metalloid

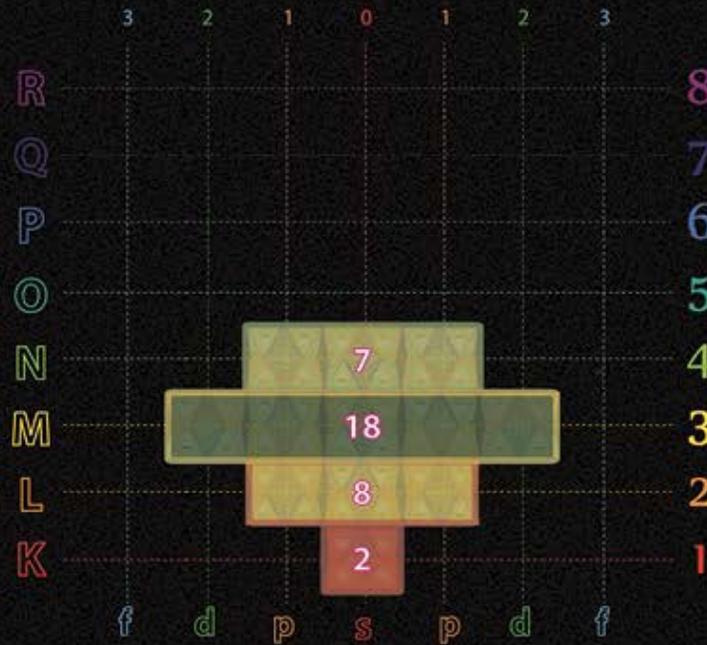


Tetryonics 53.32 - Germanium atomic config

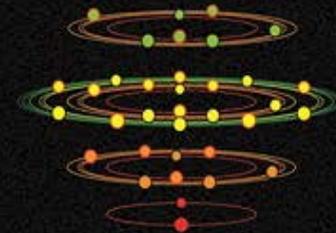
elemental family geometry



Bromine



electron configuration

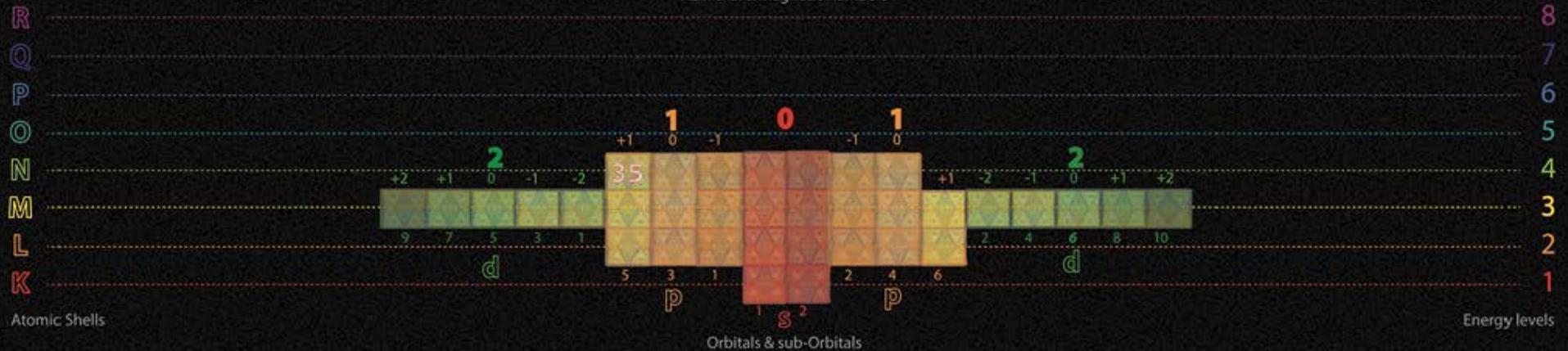


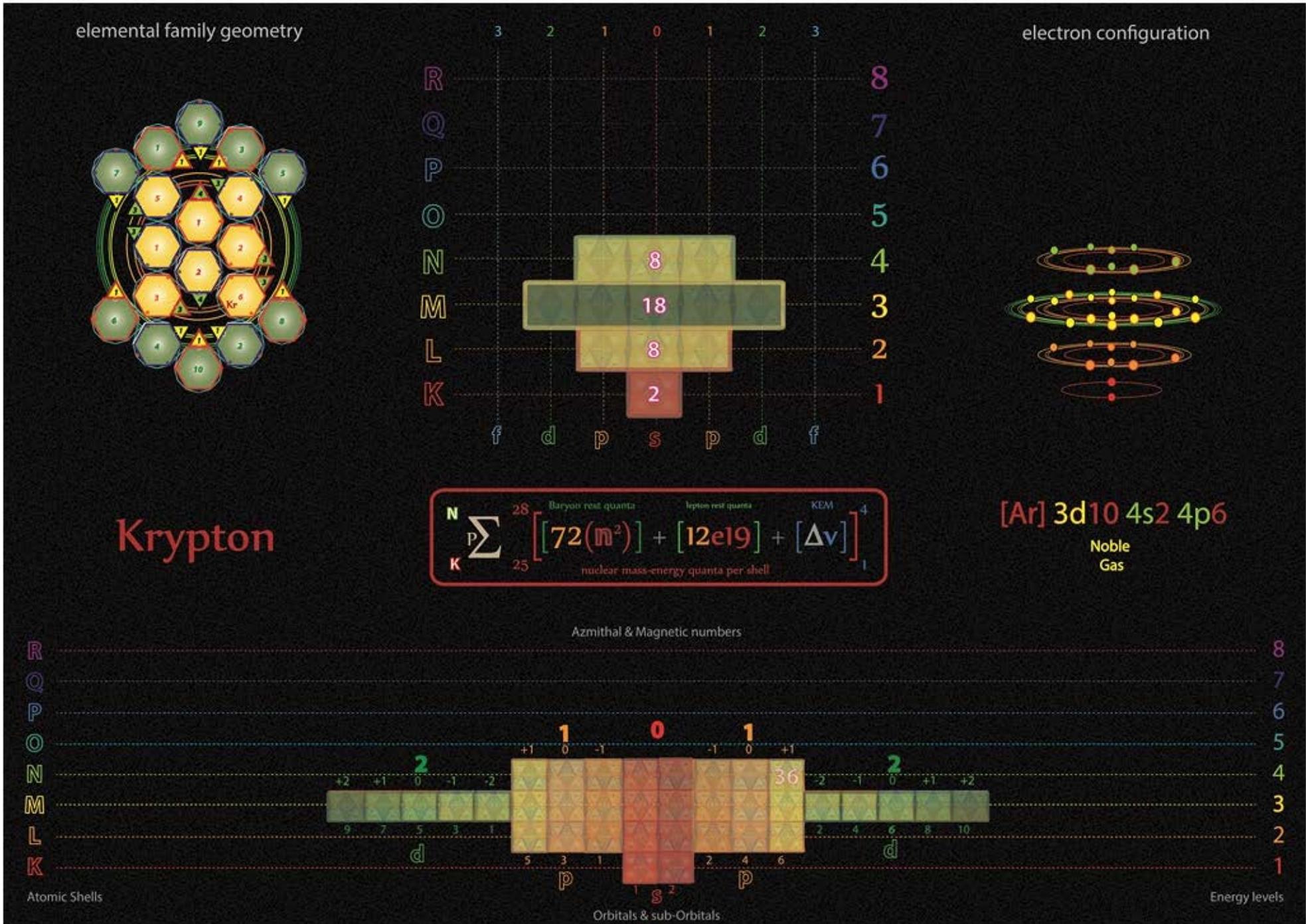
$${}_{\text{K}}^{\text{N}}\text{P}\sum_{\text{K}}^{28} \left[\overset{\text{Baryon rest quanta}}{72(\text{m}^2)} + \overset{\text{lepton rest quanta}}{12\text{e}19} + \overset{\text{KEM}}{[\Delta\text{v}]} \right]_1^4$$

nuclear mass-energy quanta per shell

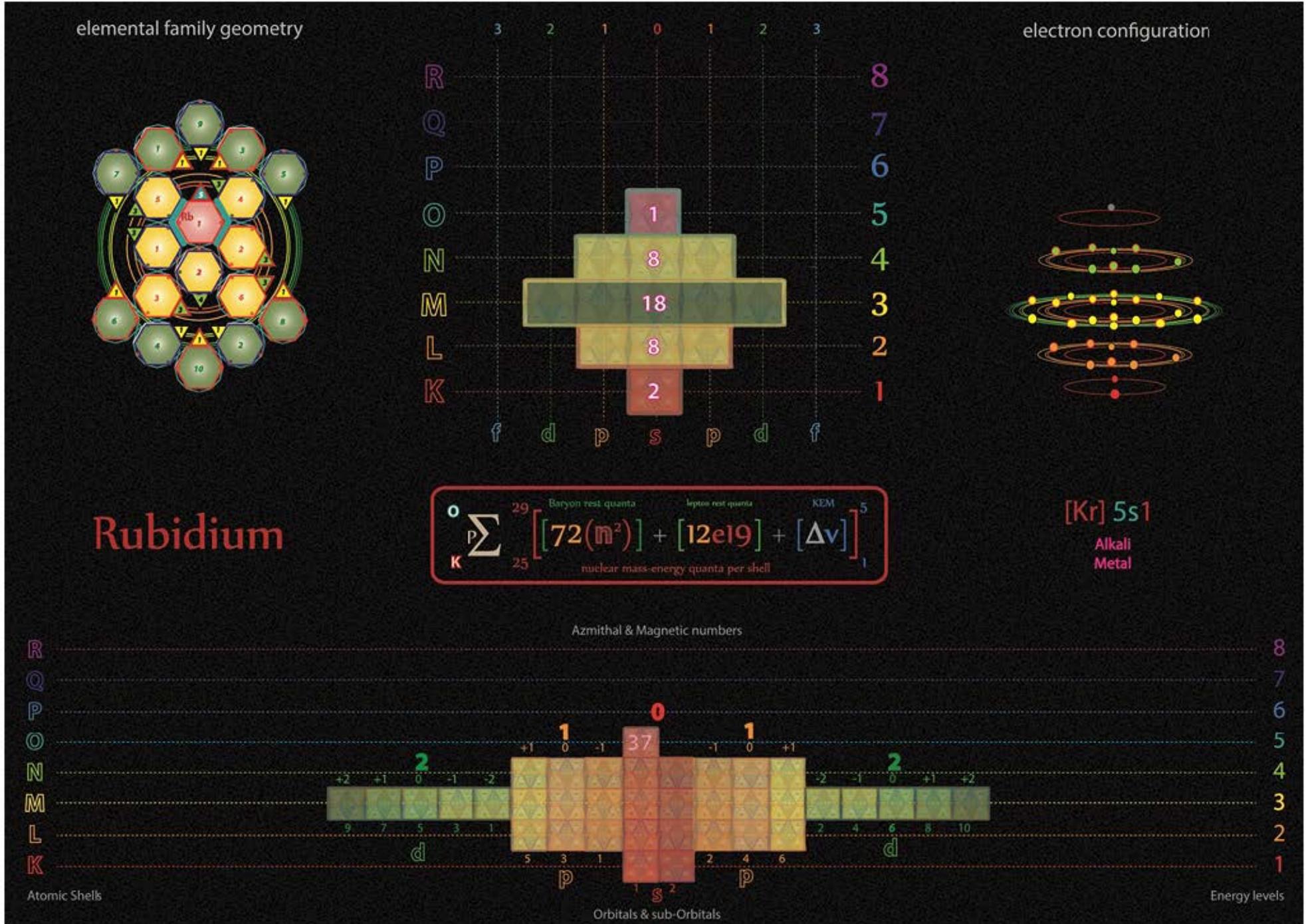


Azmithal & Magnetic numbers

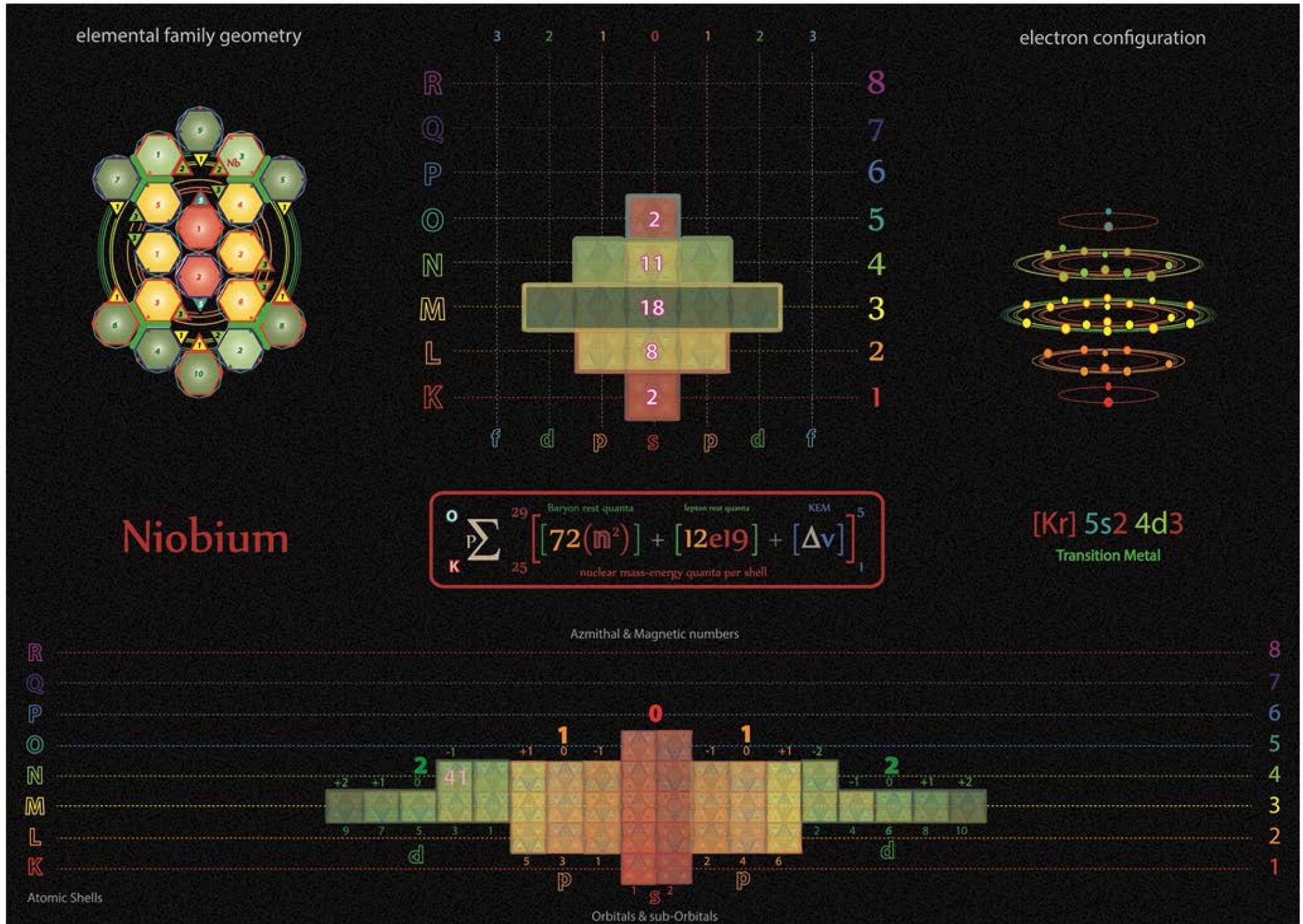




Tetryonics 53.36 - Krypton atomic config



Tetryonics 53.37 - Rubidium atomic config

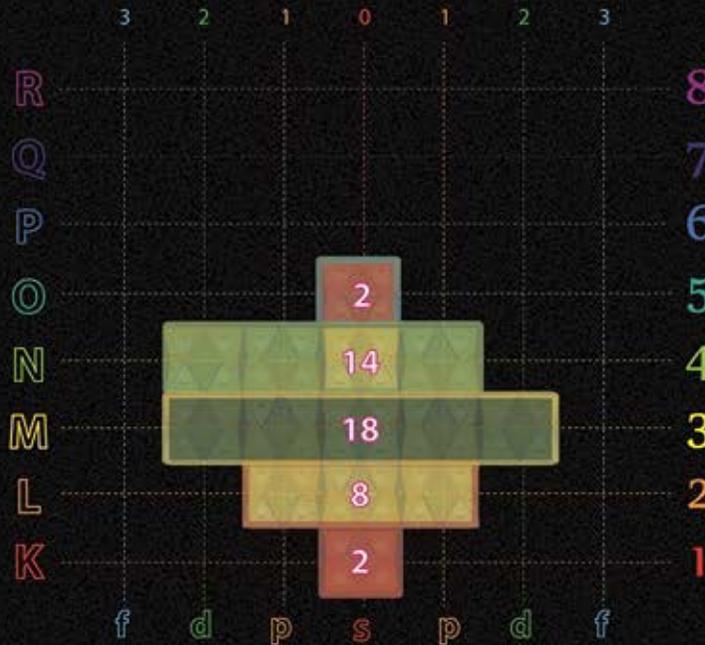
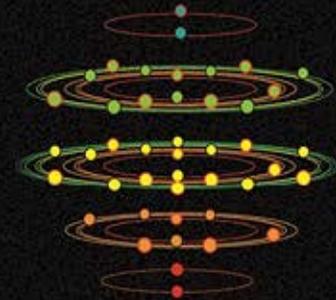


Tetryonics 53.41 - Niobium atomic config

elemental family geometry



electron configuration



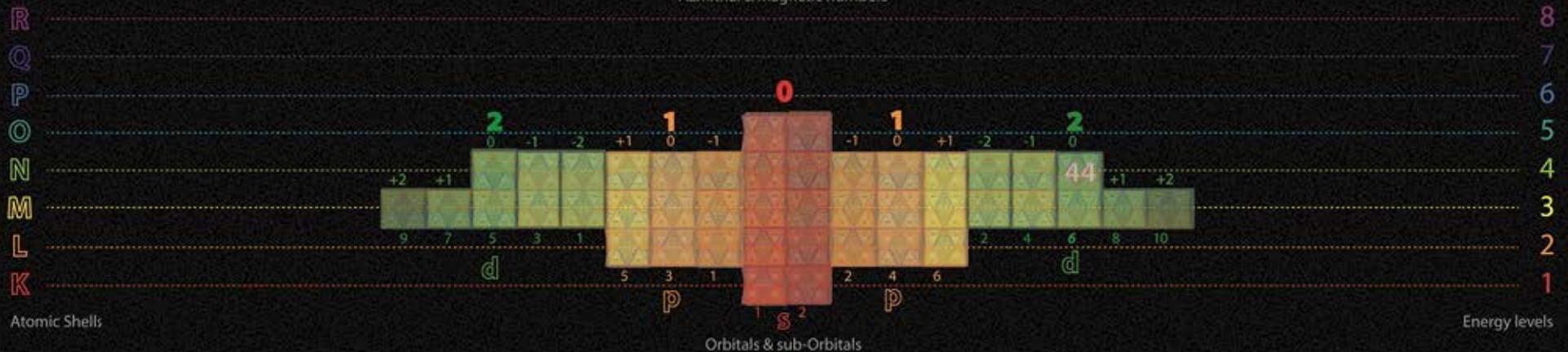
Ruthenium

$${}_{25}^{29}\text{Ru} \left[\overset{\text{Baryon rest quanta}}{72(m^2)} + \overset{\text{lepton rest quanta}}{12e19} + \overset{\text{KEM}}{\Delta v} \right]_1^5$$

nuclear mass-energy quanta per shell

[Kr] 5s² 4d⁶
Transition Metal

Azimuthal & Magnetic numbers

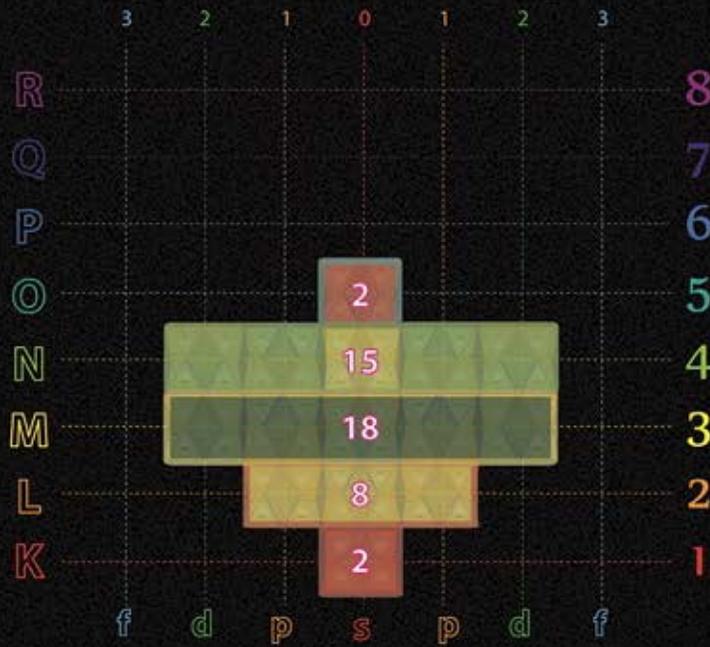
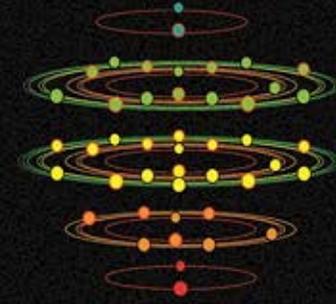


Tetryonics 53.44 - Ruthenium atomic config

elemental family geometry



electron configuration



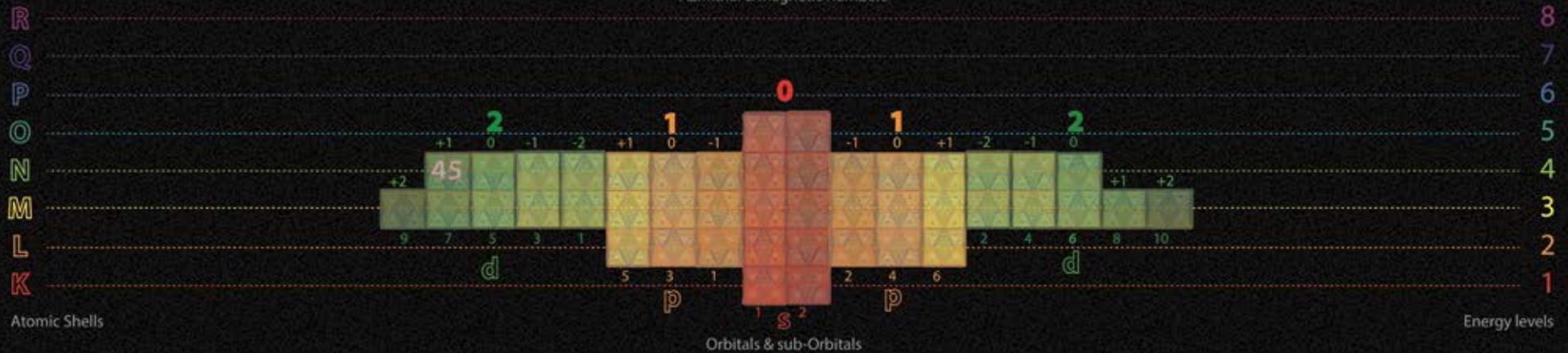
Rhodium

$${}_{K}^{O}P \sum_{25}^{29} \left[\overset{\text{Baryon rest quanta}}{72(m^2)} + \overset{\text{lepton rest quanta}}{12e19} + \overset{\text{KEM}}{[\Delta v]} \right]_1^5$$

nuclear mass-energy quanta per shell

[Kr] 5s² 4d⁷
Transition Metal

Azimuthal & Magnetic numbers

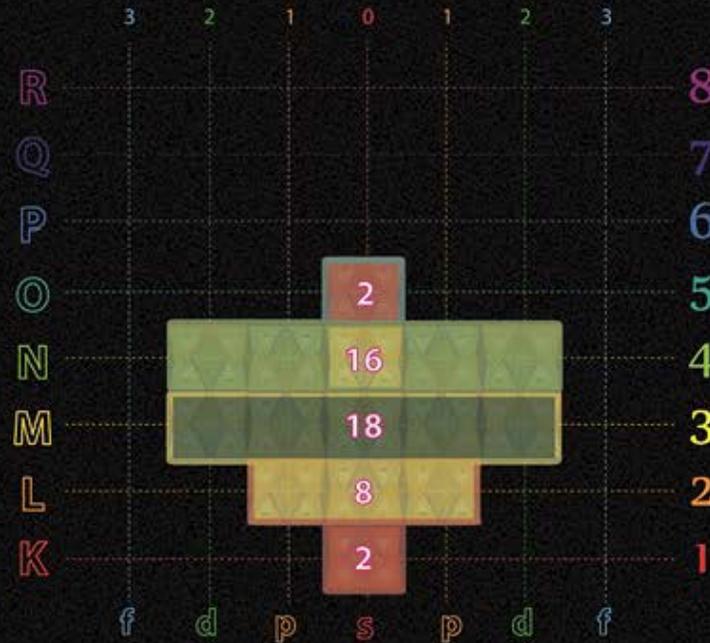
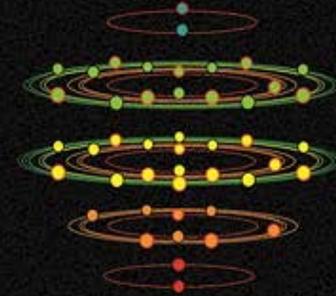


Tetryonics 53.45 - Rhodium atomic config

elemental family geometry



electron configuration

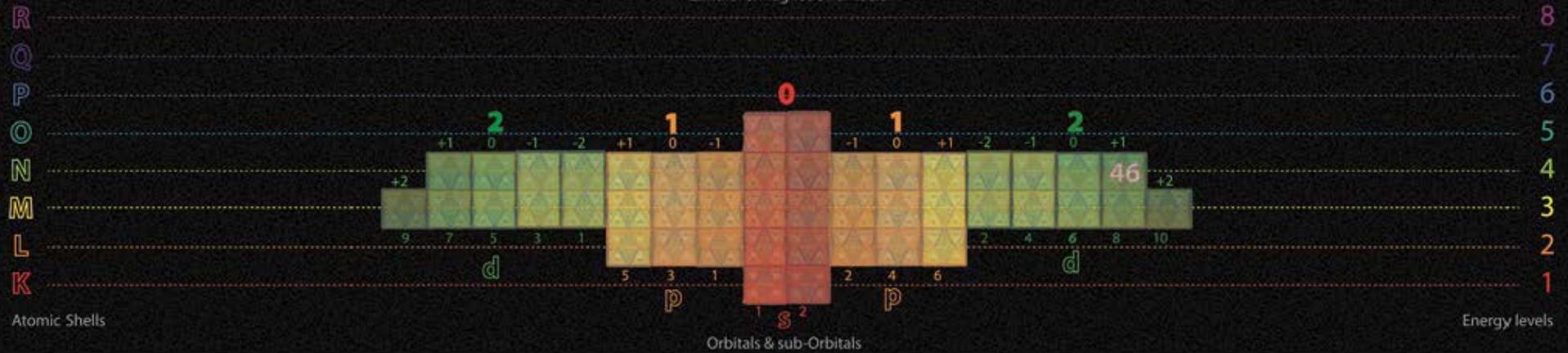


Palladium

$${}_{25}^{29}\text{Pd} \left[\begin{matrix} \text{Baryon rest quanta} & \text{Lepton rest quanta} & \text{KEM} \\ [72(m^2)] & + [12e19] & + [\Delta v] \\ \text{nuclear mass-energy quanta per shell} & & \end{matrix} \right]_1^5$$

[Kr] 5s² 4d⁸
Transition Metal

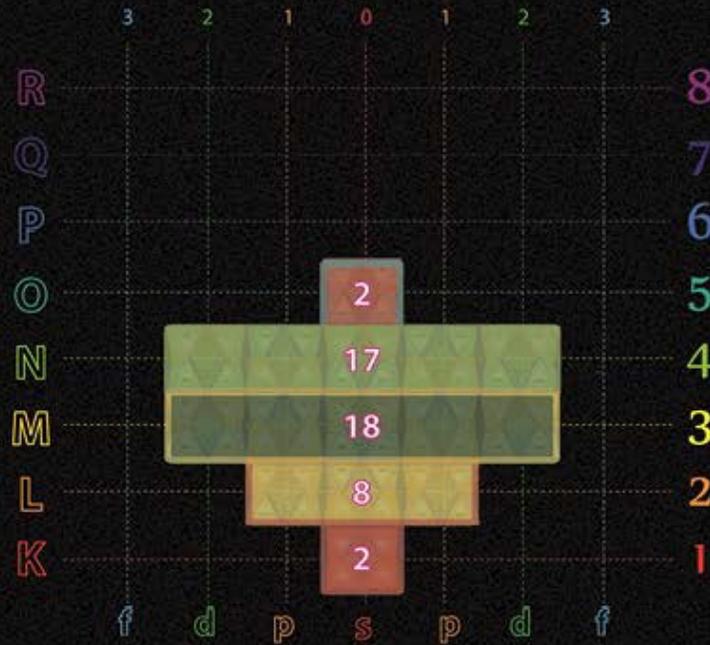
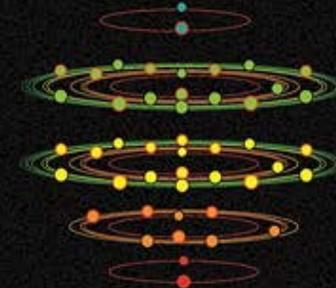
Azimuthal & Magnetic numbers



elemental family geometry



electron configuration

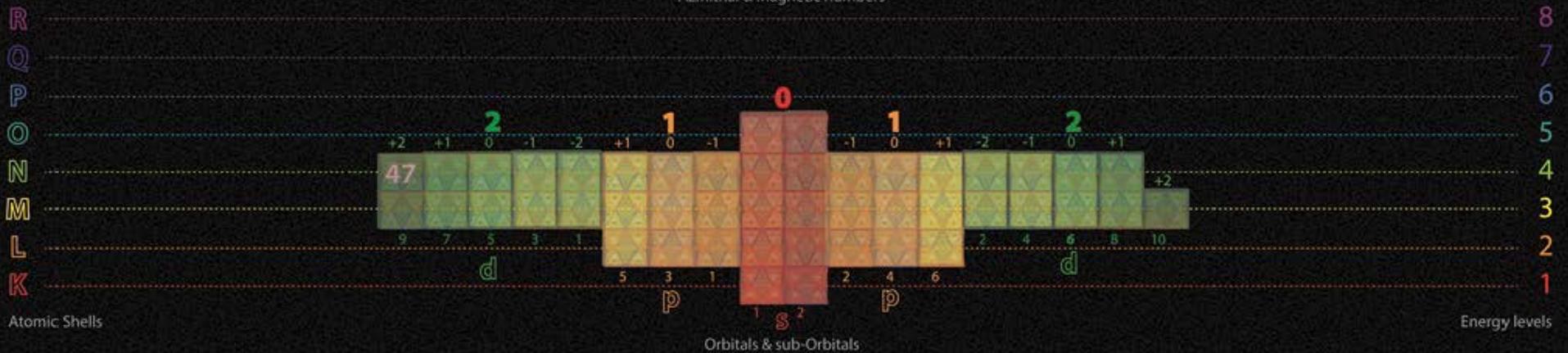


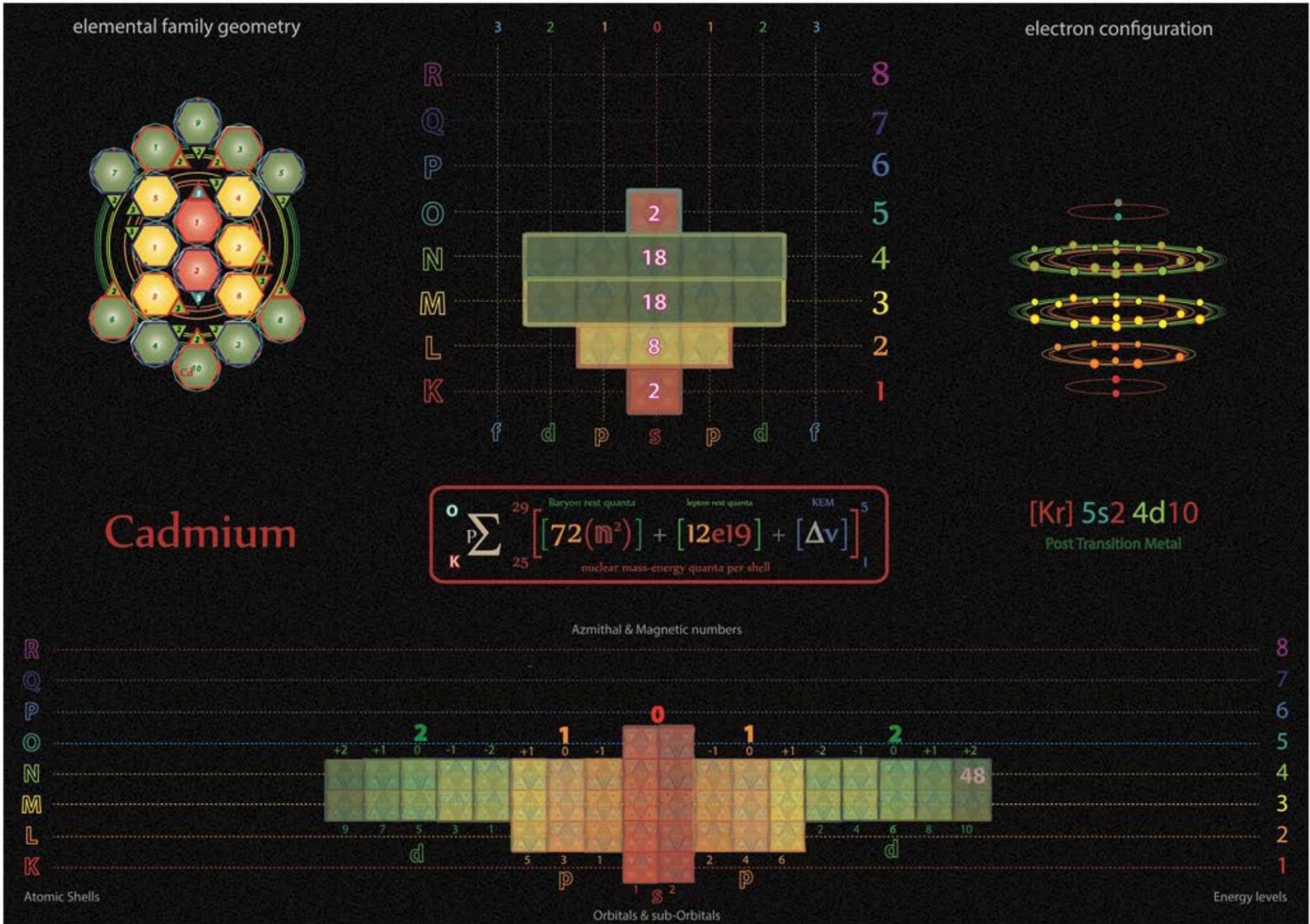
Silver

$${}_{K}^{O}P \sum_{25}^{29} \left[\underset{\text{nuclear mass-energy quanta per shell}}{72(m^2)} \right] + \underset{\text{lepton rest quanta}}{[12e19]} + \underset{\text{KEM}}{[\Delta v]} \Bigg]_1^5$$

[Kr] 5s² 4d⁹
Post Transition Metal

Azimuthal & Magnetic numbers



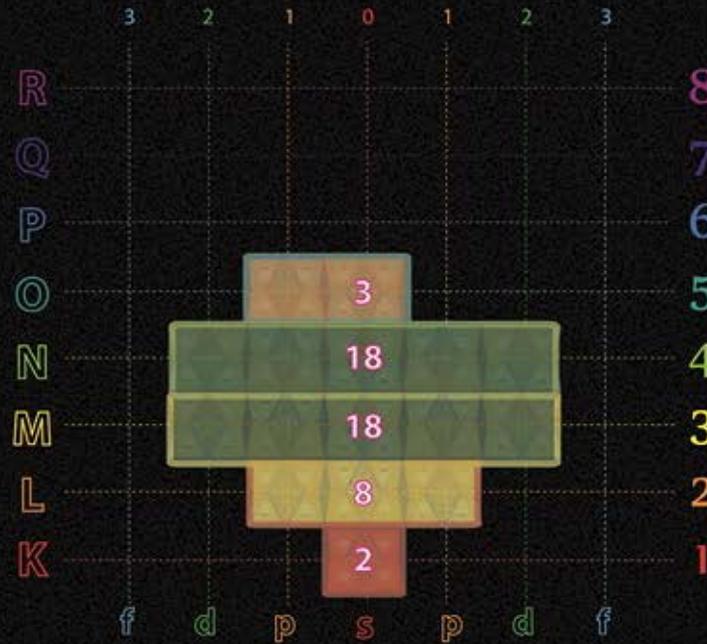


Tetryonics 53.48 - Cadmium atomic config

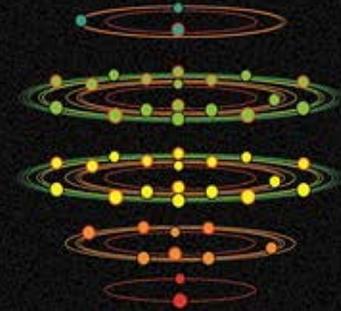
elemental family geometry



Indium



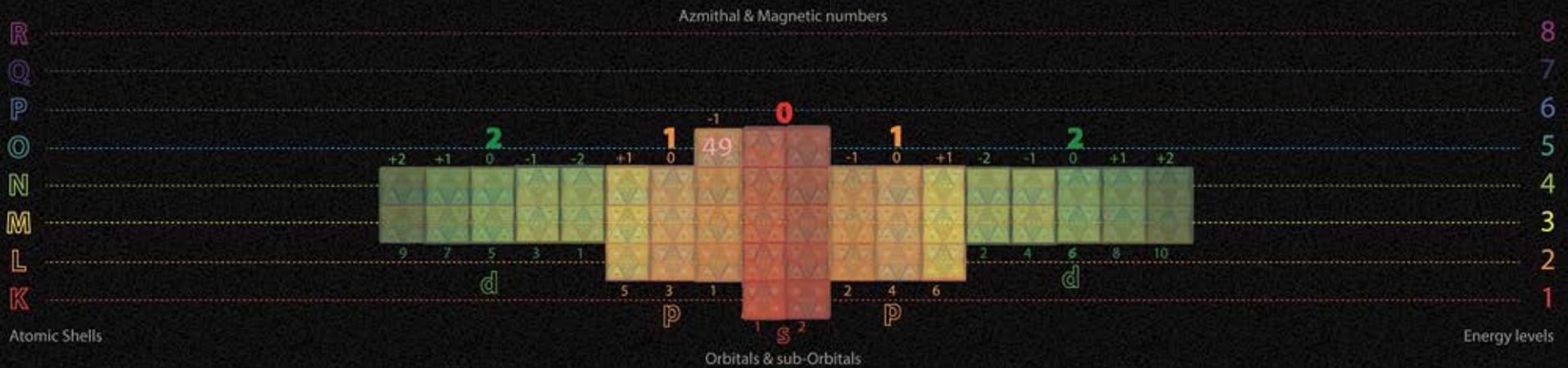
electron configuration



$${}^{\circ}_{\text{K}}\text{P}\sum_{25}^{29} \left[\overset{\text{Baryon rest quanta}}{72(\text{m}^2)} + \overset{\text{lepton rest quanta}}{12\text{e}19} + \overset{\text{KEM}}{[\Delta\text{v}]} \right]_1^5$$

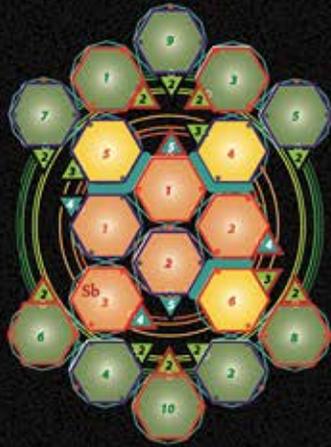
nuclear mass-energy quanta per shell

[Kr] 5s² 4d¹⁰ 5p¹
Metalloid

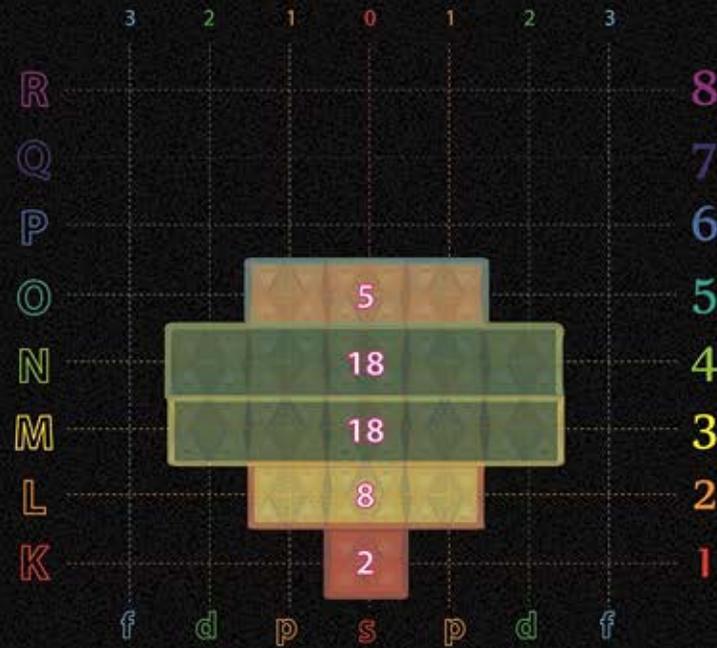
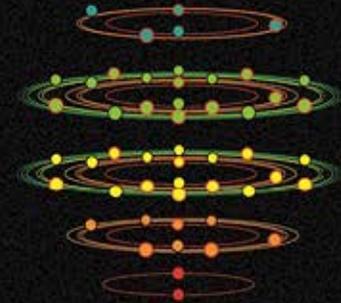


Tetryonics 53.49 - Indium atomic config

elemental family geometry



electron configuration

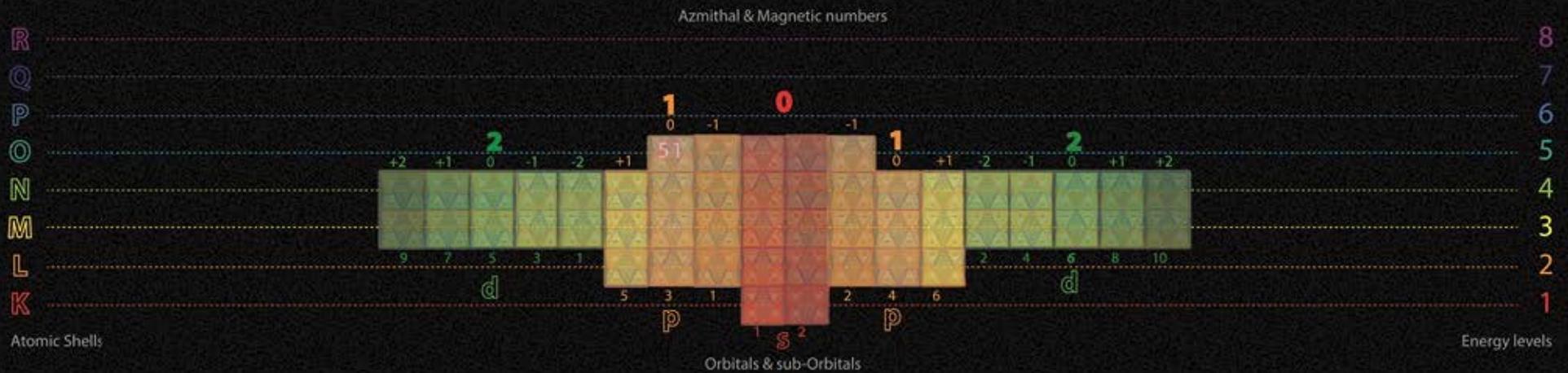


Antimony

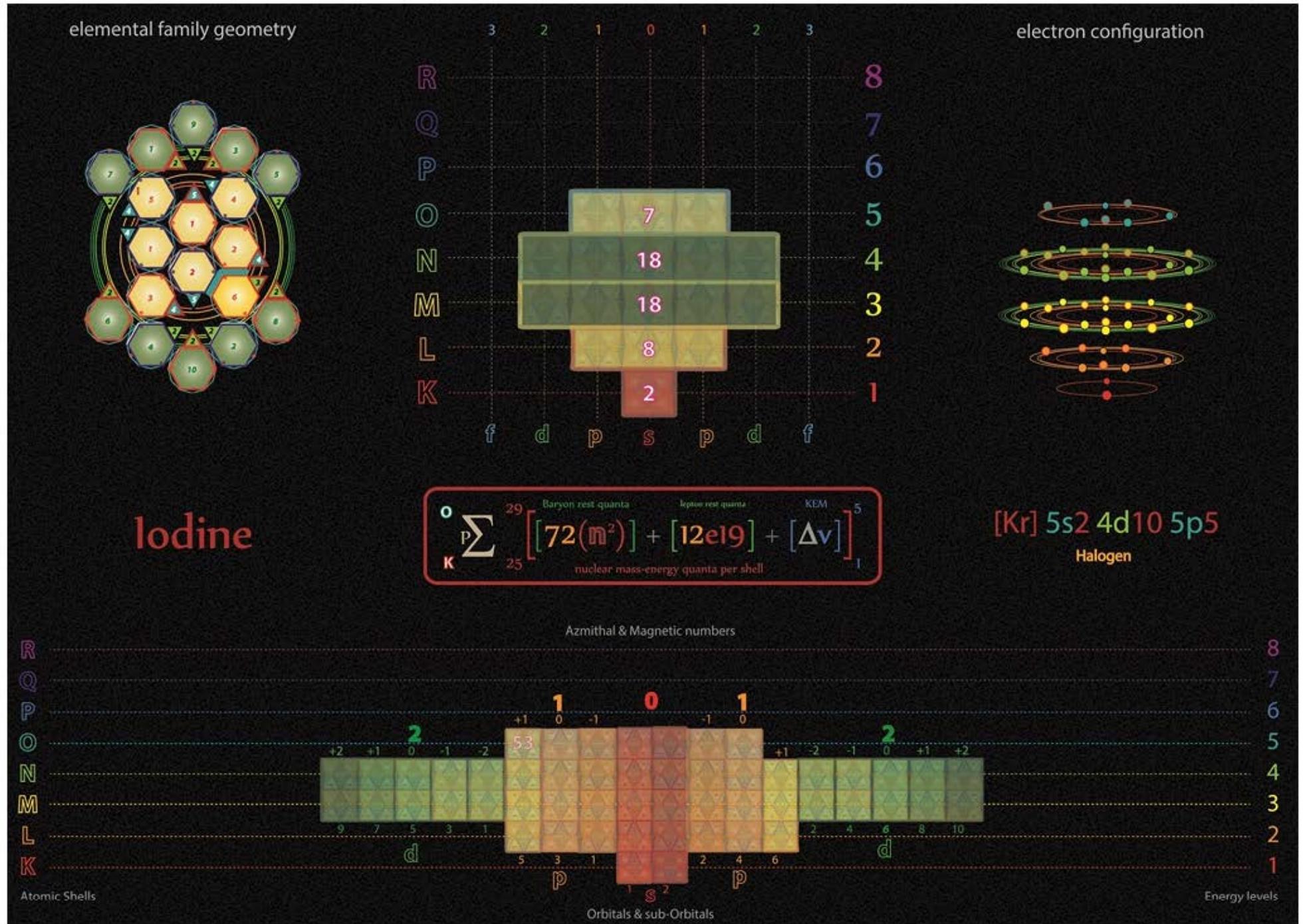
$${}^0_{\text{K}}\text{P}\sum_{25}^{29} \left[72(\text{m}^2) + [12\text{e}19] + [\Delta\text{v}] \right]_1^{\text{KEM}5}$$

nuclear mass-energy quanta per shell

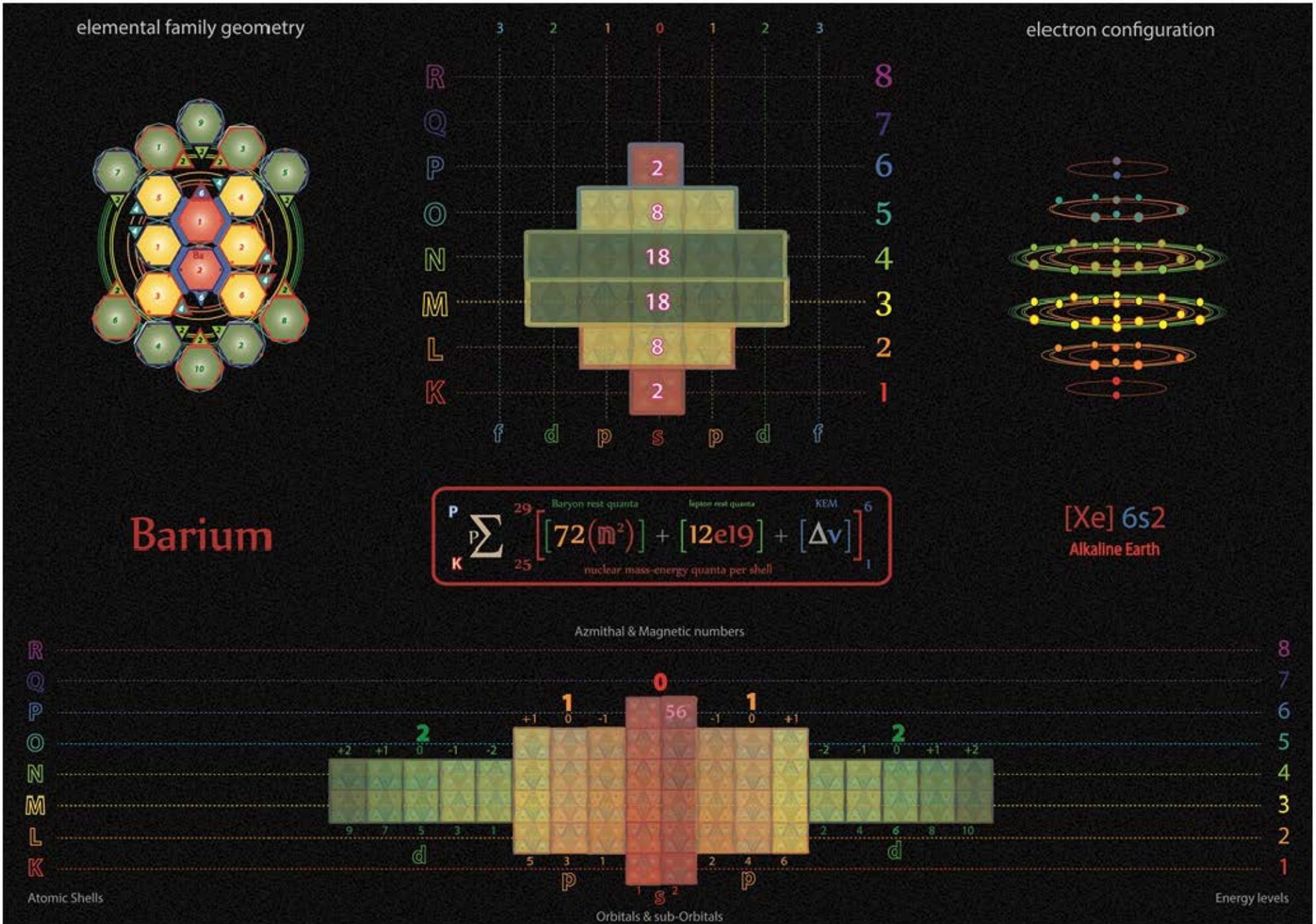
[Kr] 5s² 4d¹⁰ 5p³
Metalloid



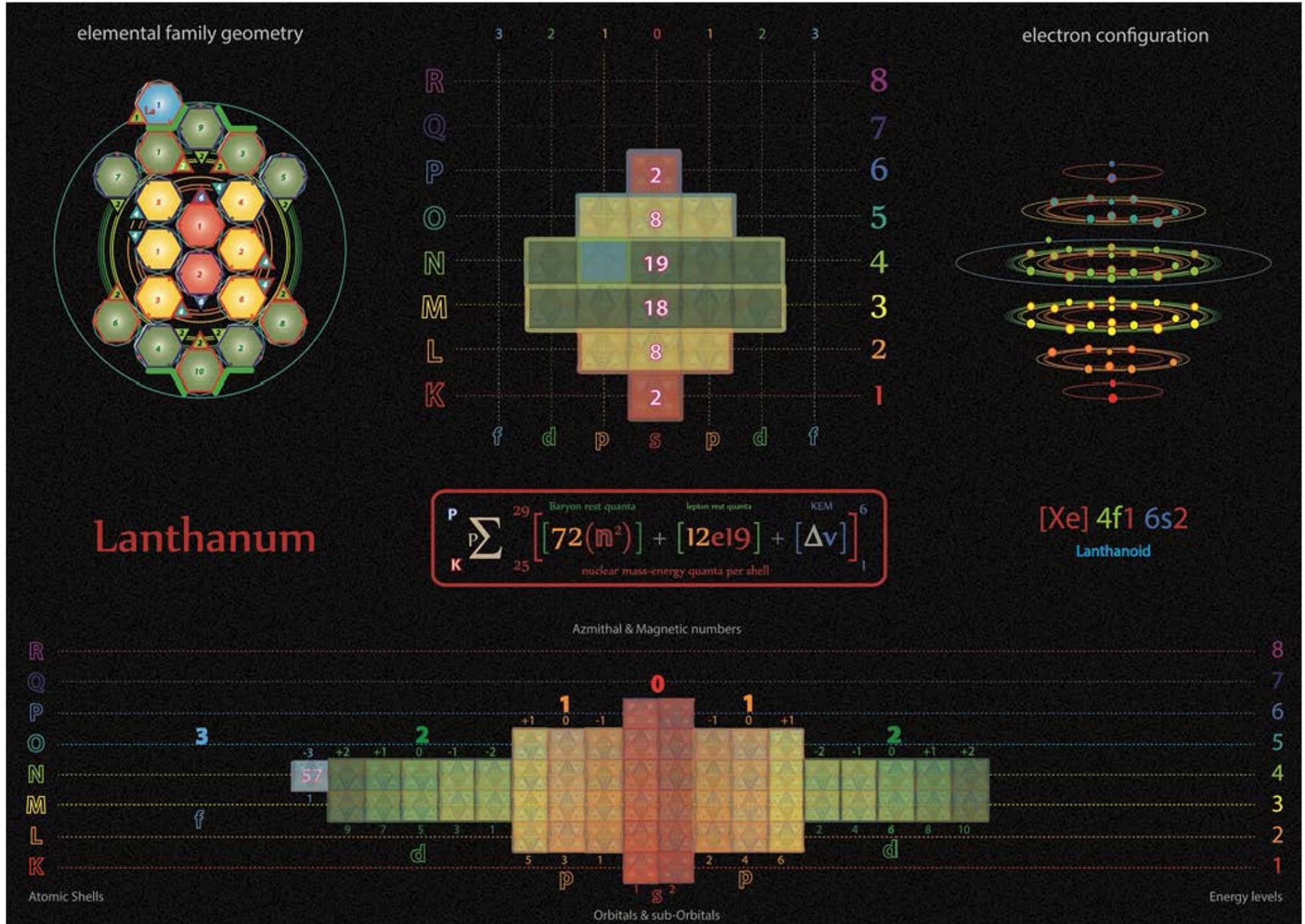
Tetryonics 53.51 - Antimony atomic config



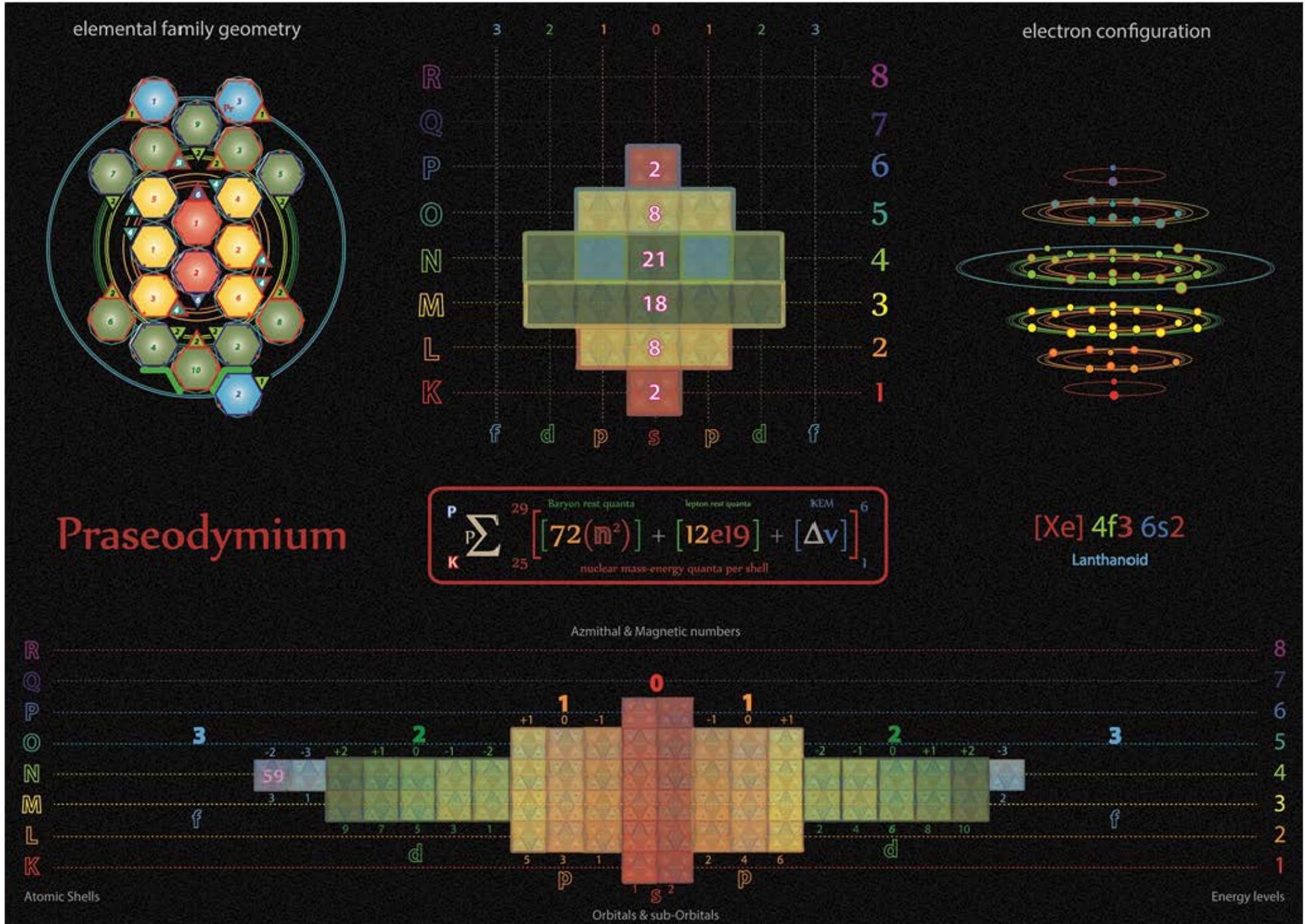
Tetryonics 53.53 - Iodine atomic config



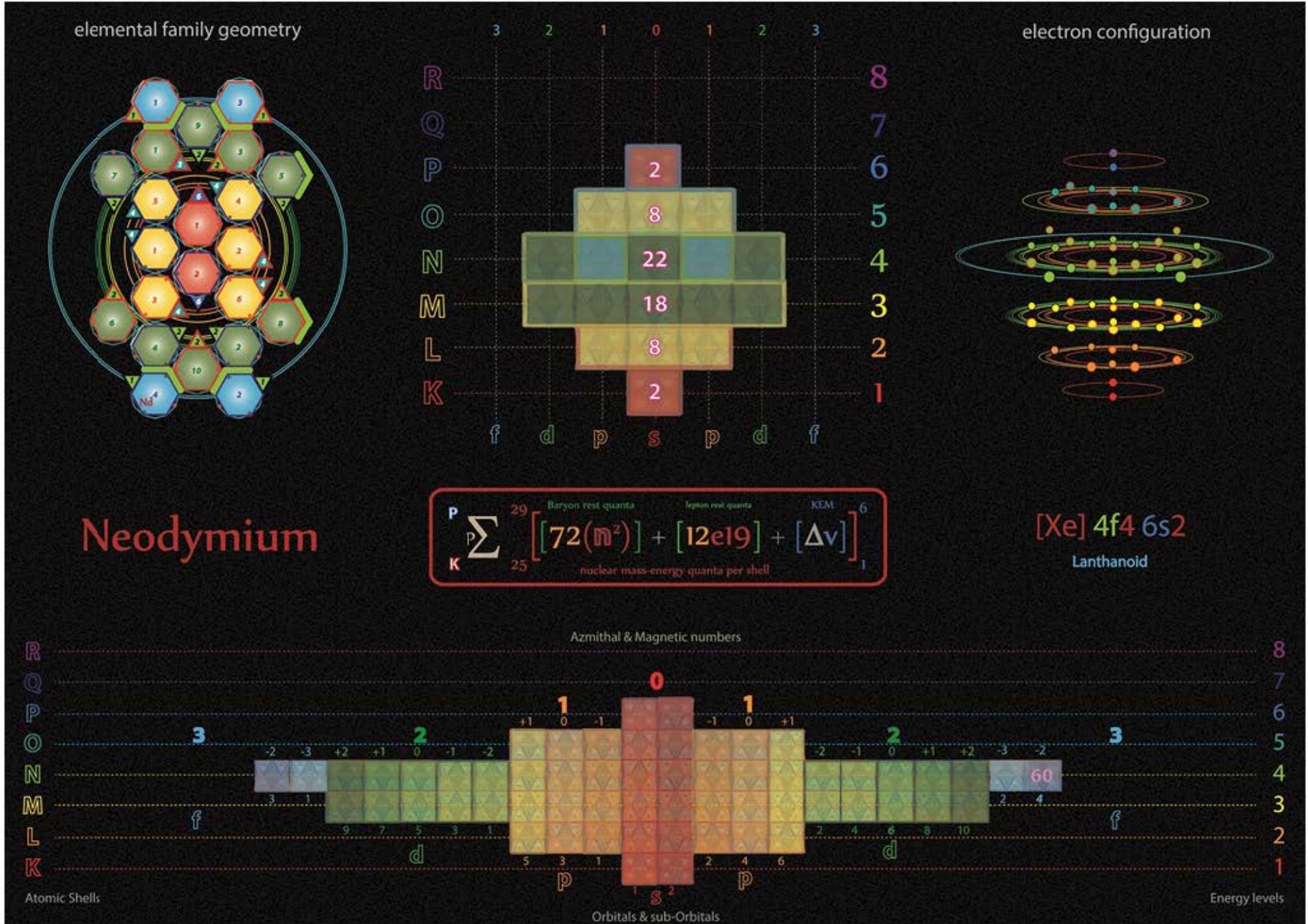
Tetryonics 53.56 - Barium atomic config



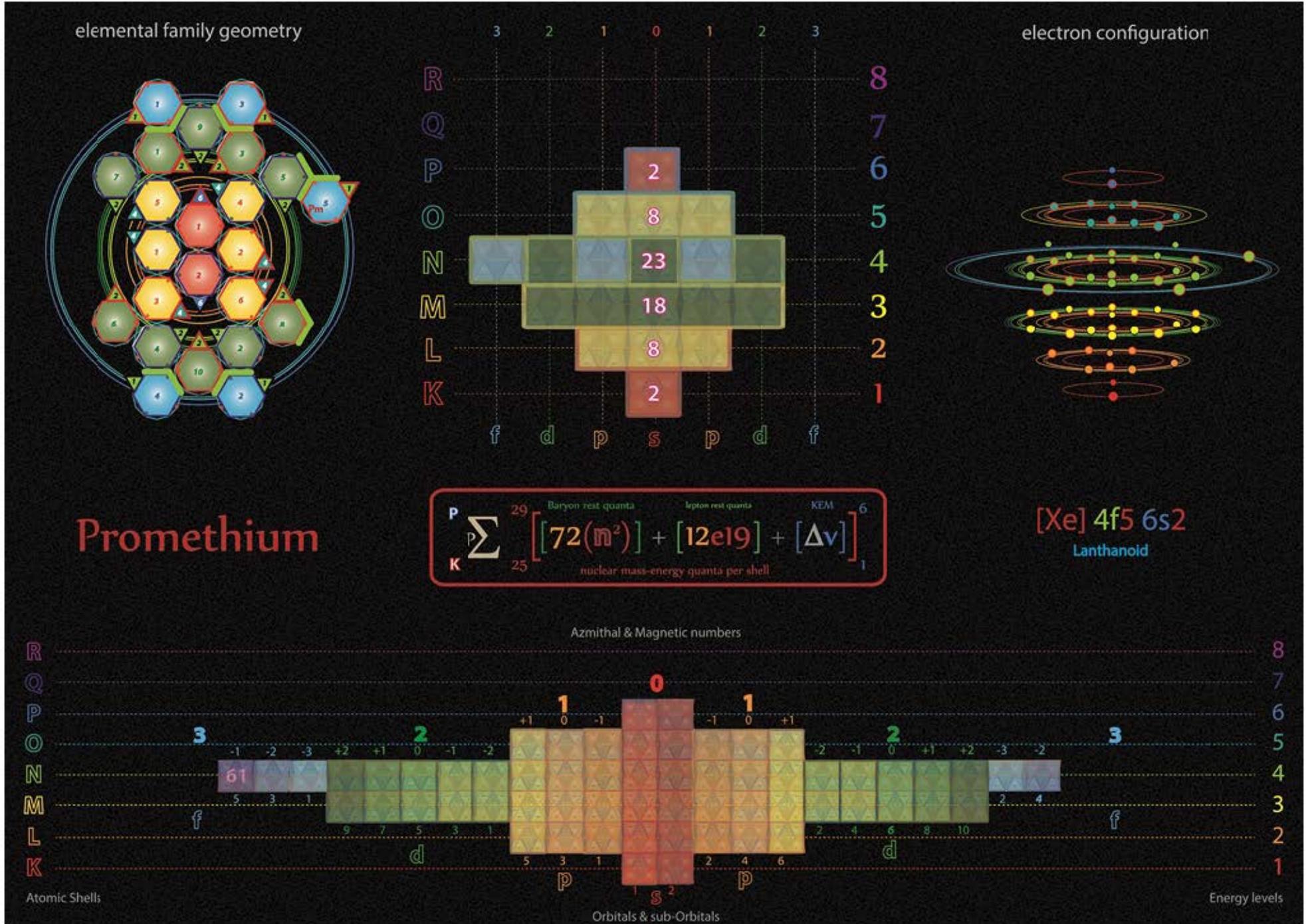
Tetryonics 53.57 - Lanthanum atomic config



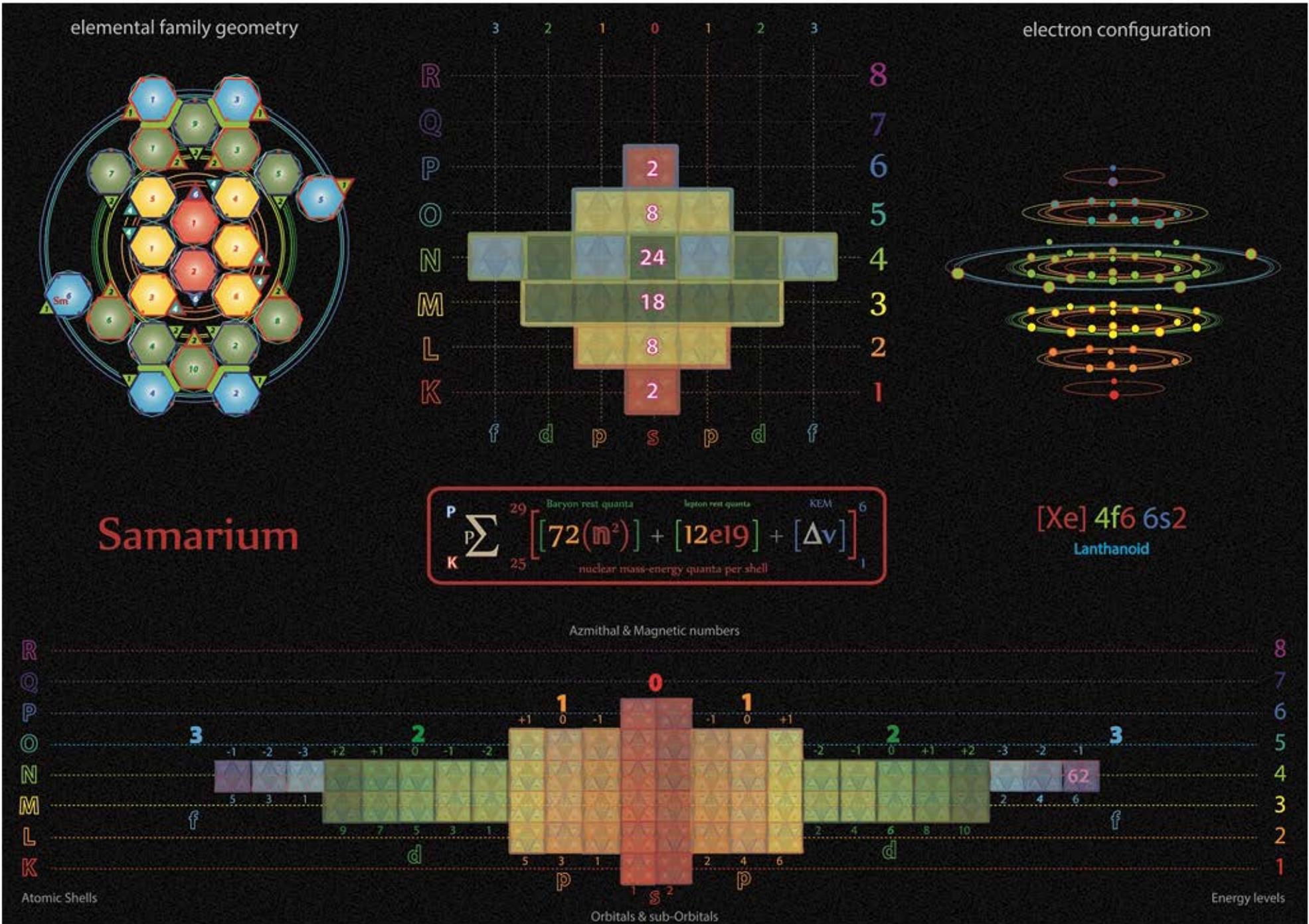
Tetryonics 53.59 - Praseodymium atomic config



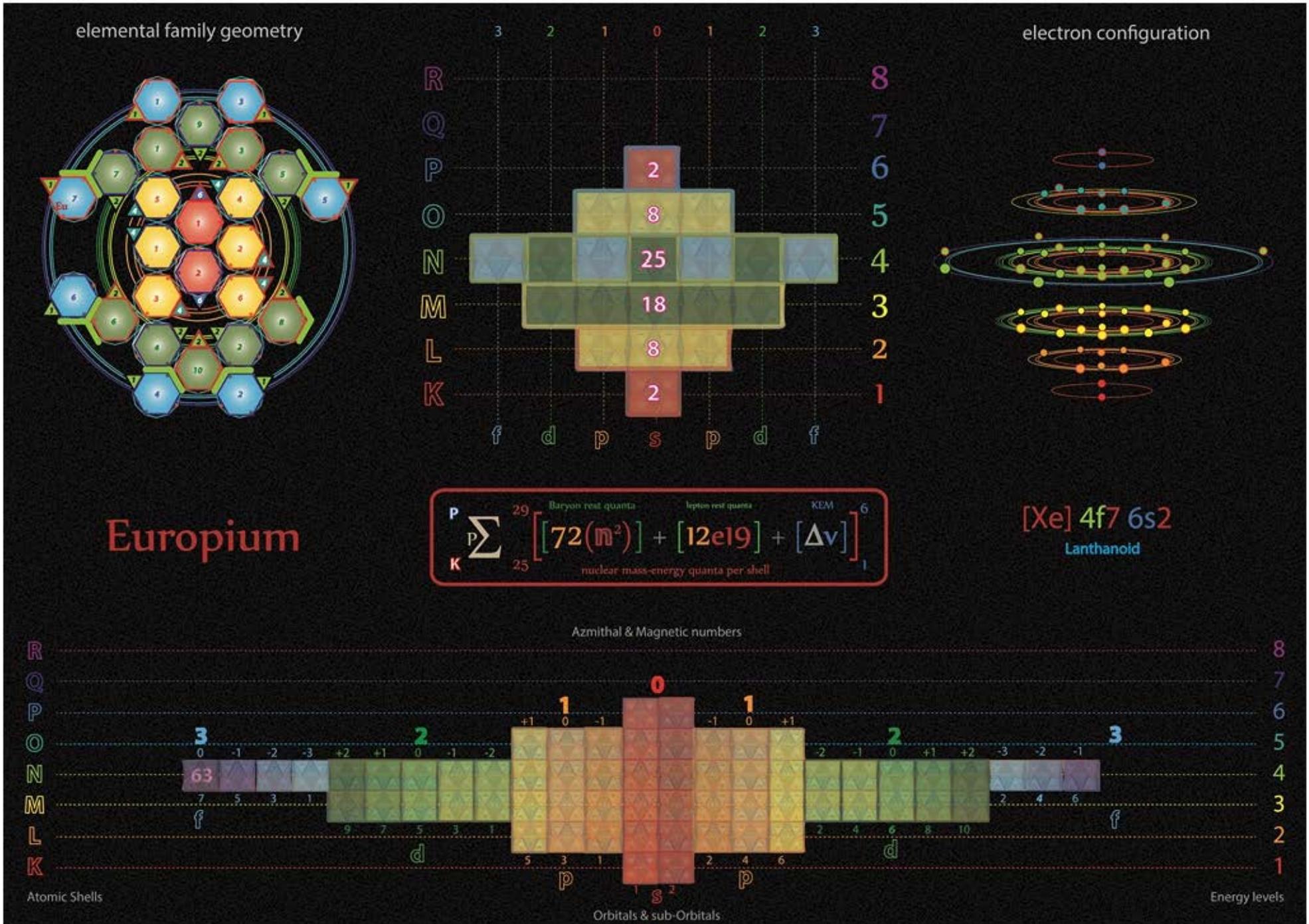
Tetryonics 53.60 - Neodymium atomic config



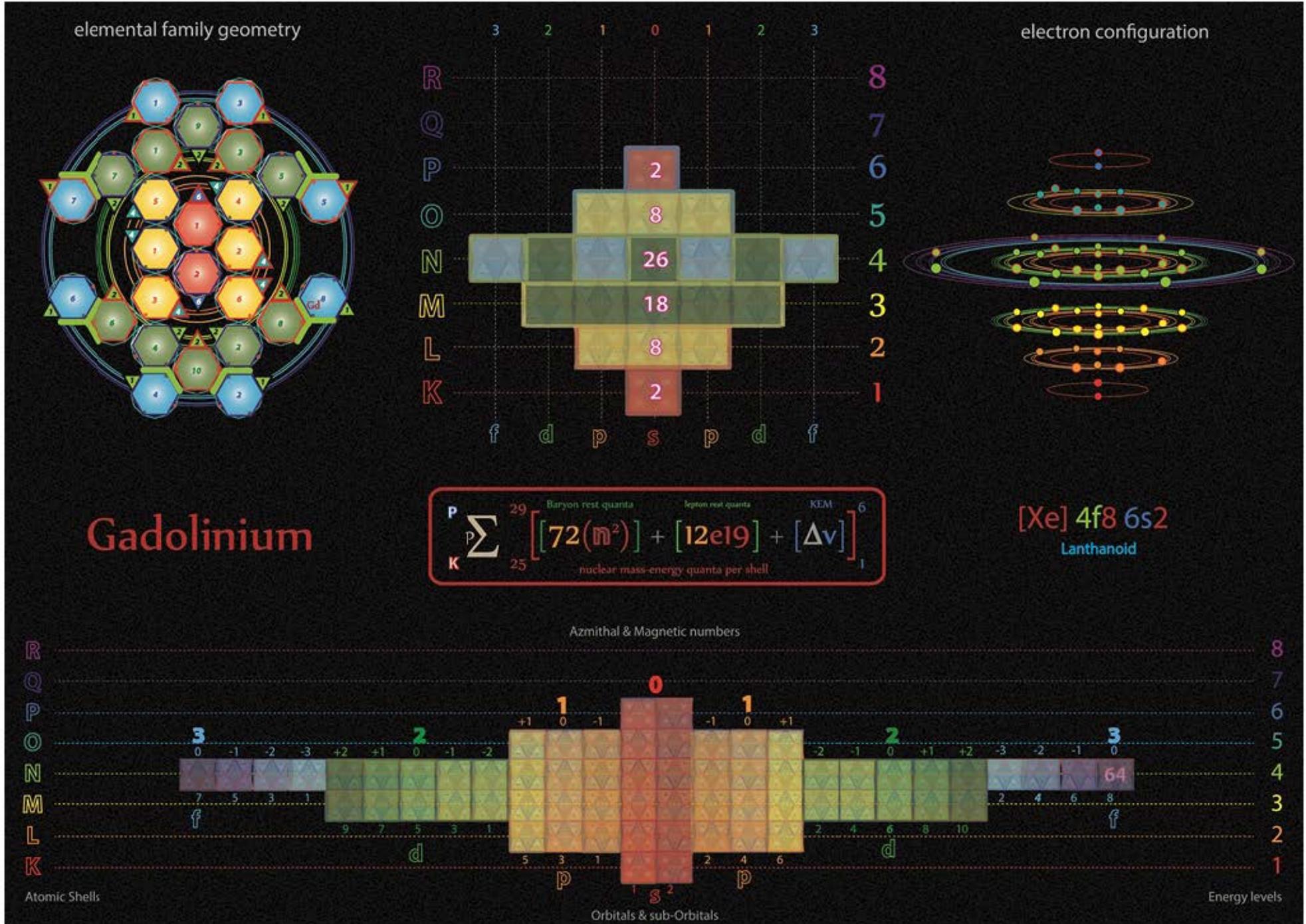
Tetryonics 53.61 - Promethium atomic config



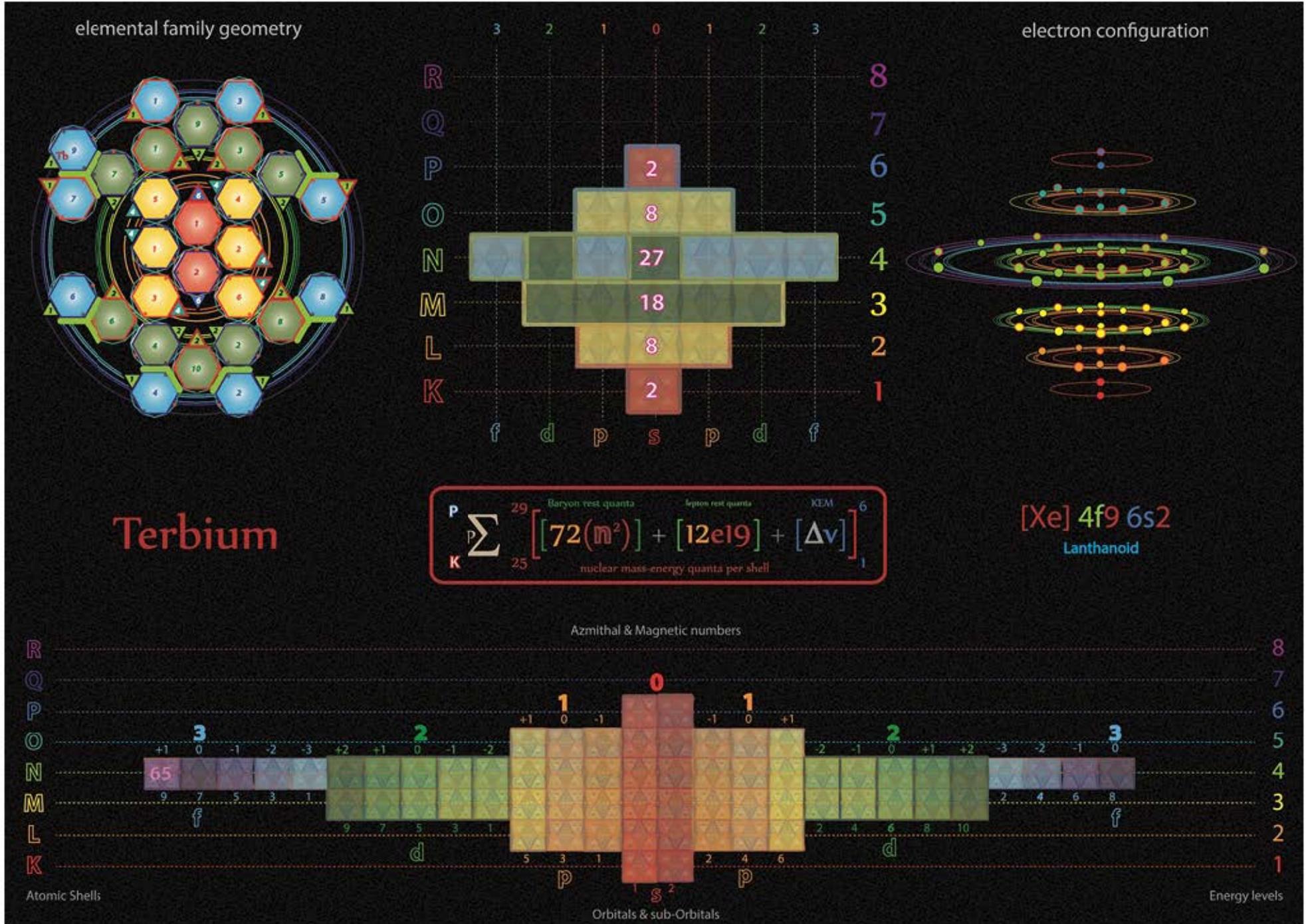
Tetryonics 53.62 - Samarium atomic config



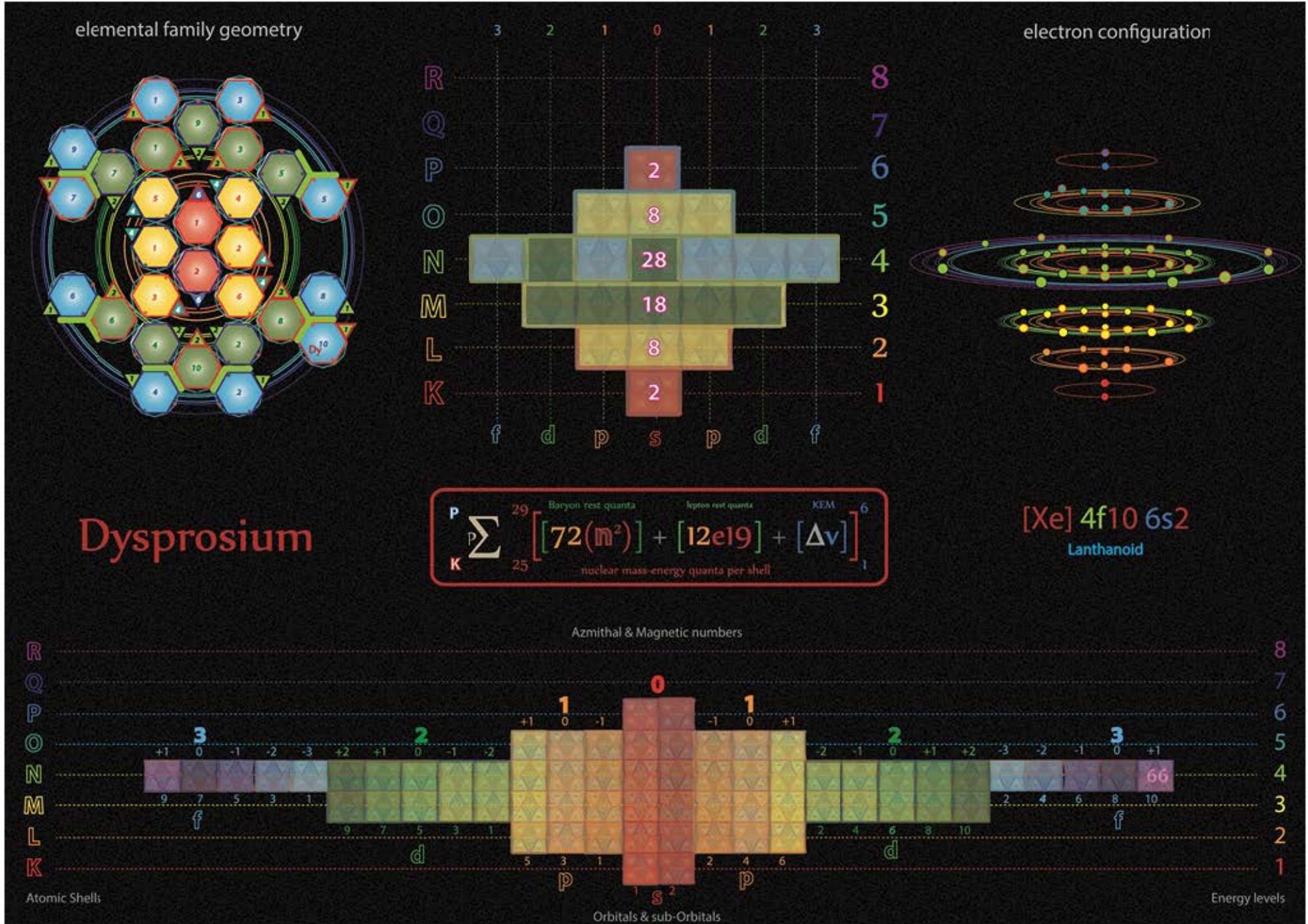
Tetryonics 53.63 - Europium atomic config



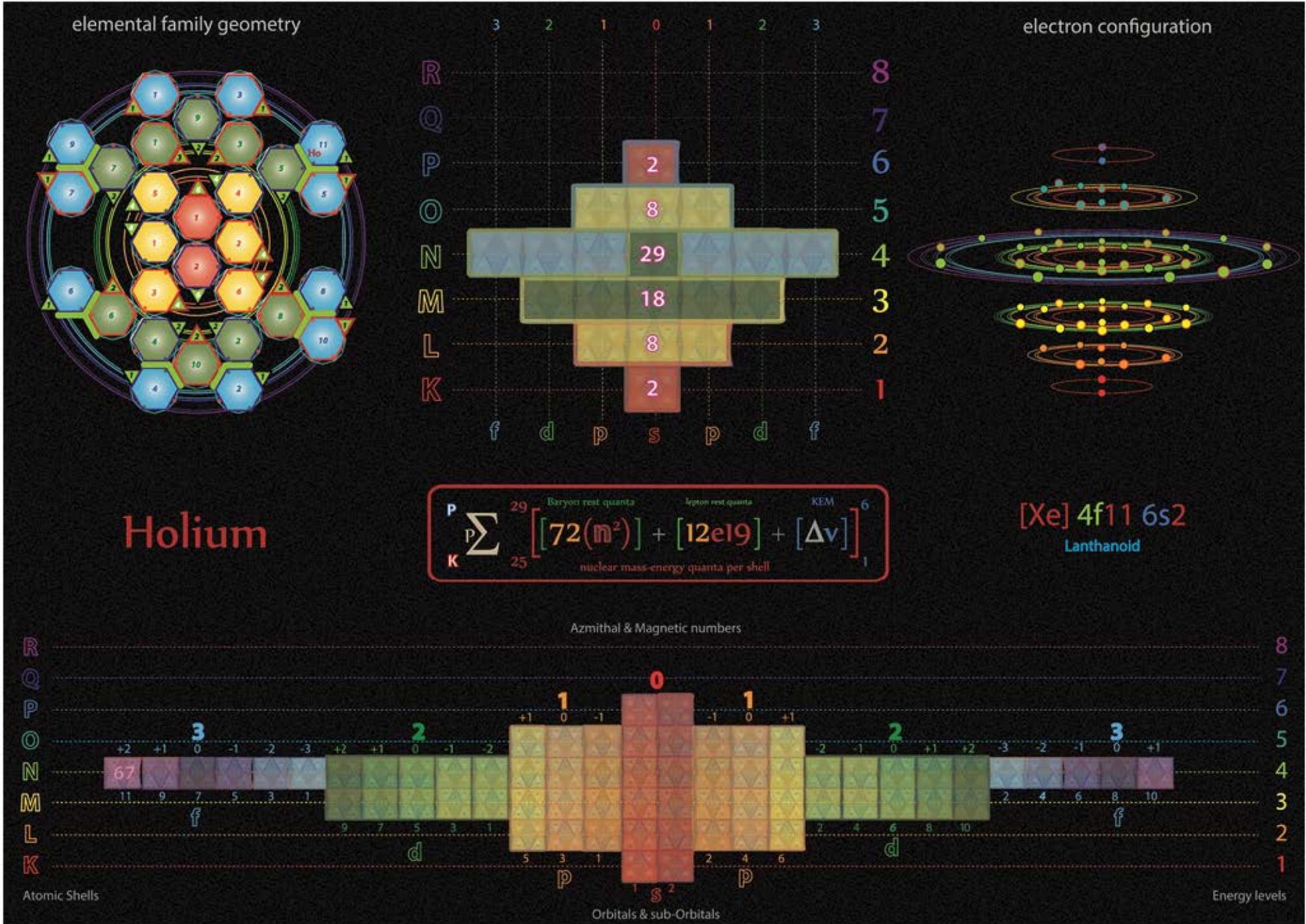
Tetryonics 53.64 - Gadolinium atomic config



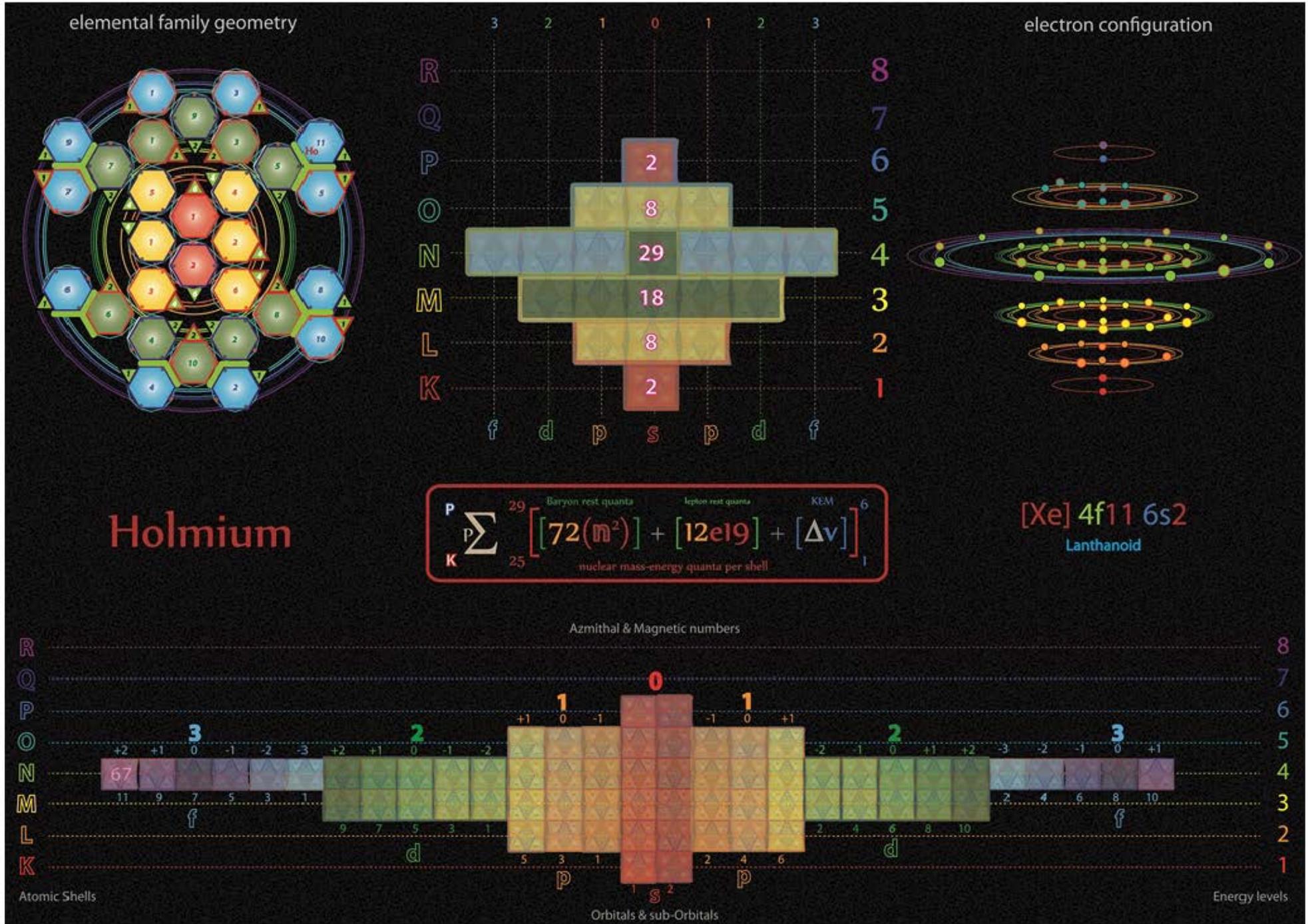
Tetryonics 53.65 - Terbium atomic config



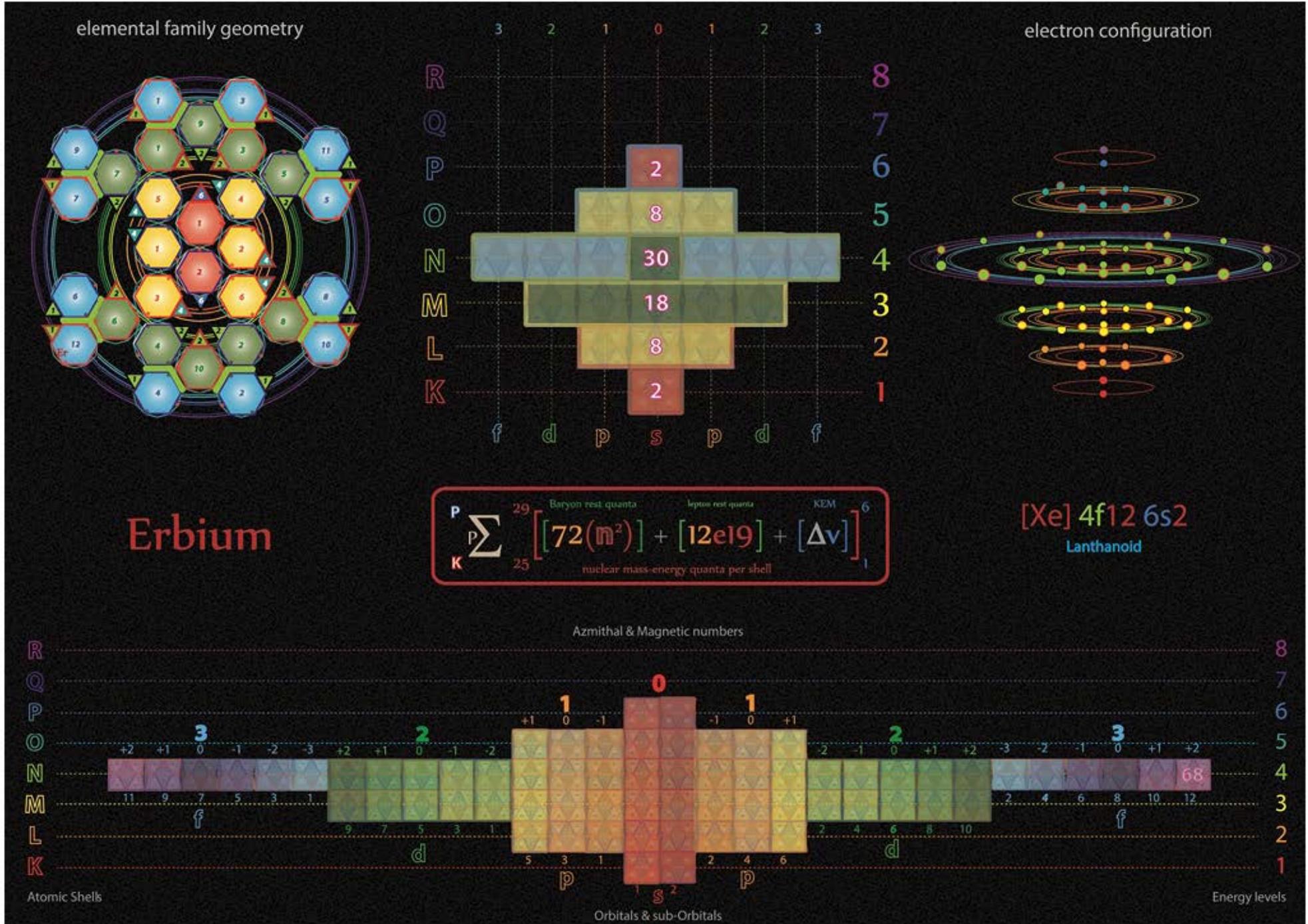
Tetryonics 53.66 - Dysprosium atomic config



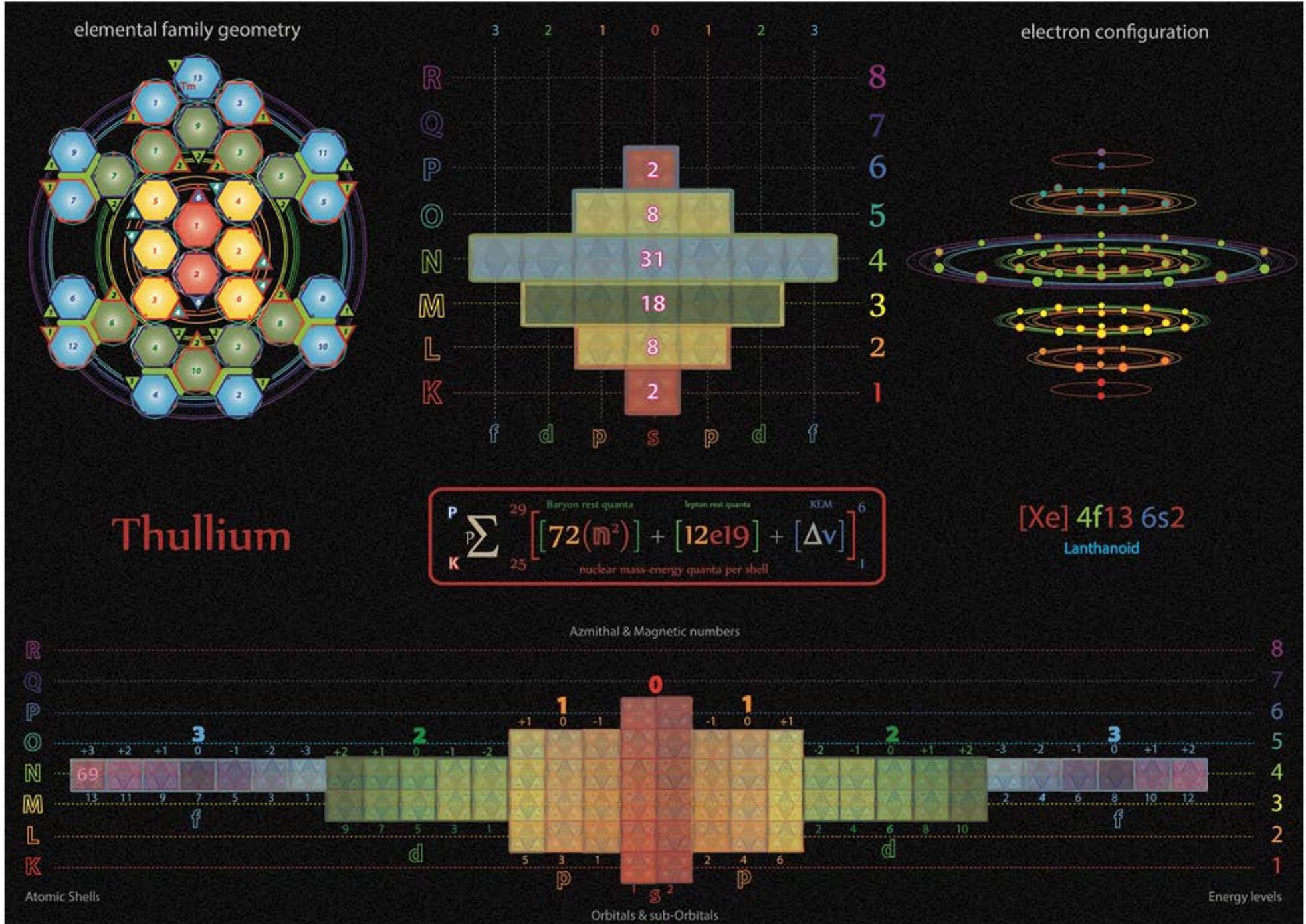
Tetryonics 53.67 - Holium atomic config



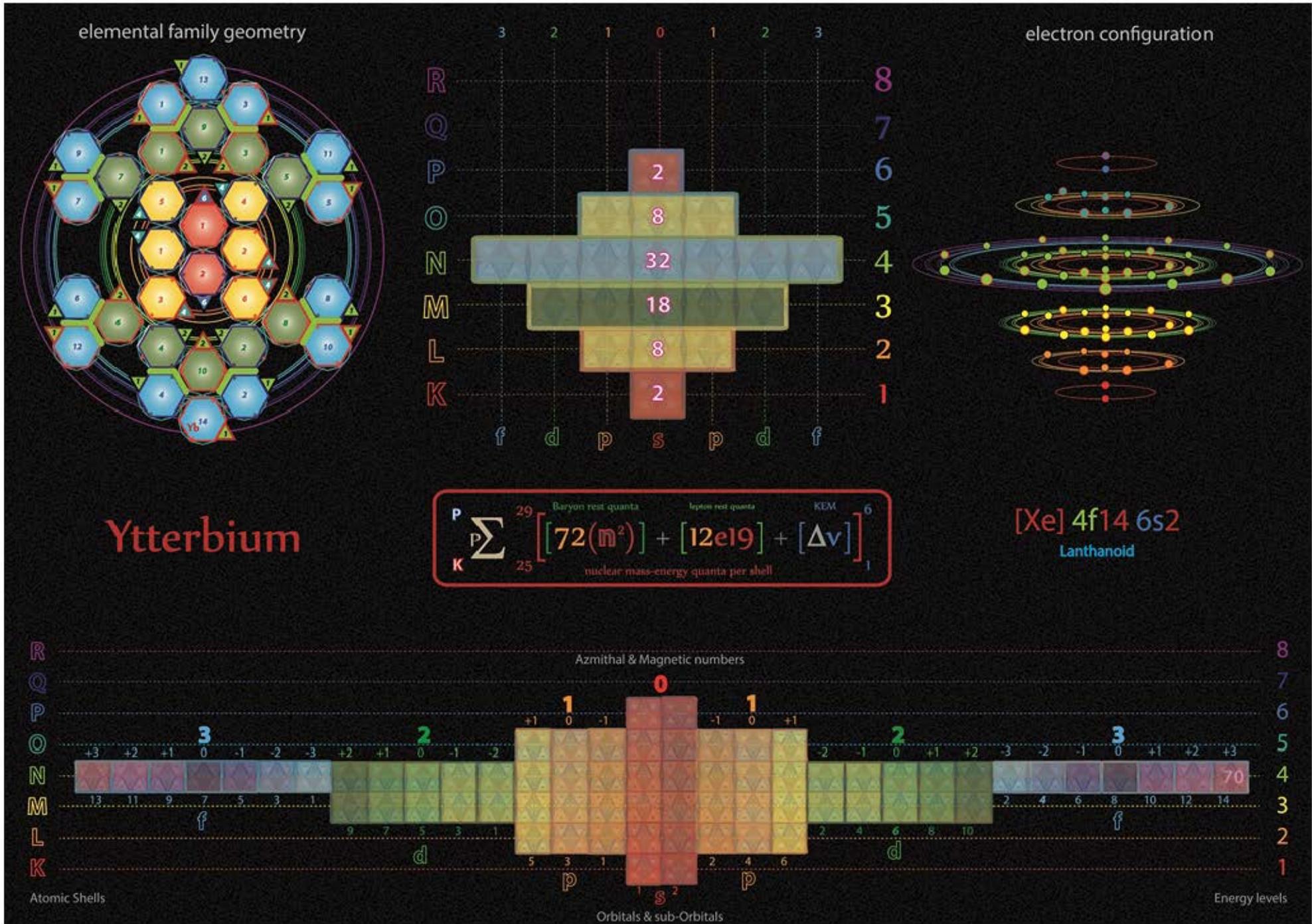
Tetryonics 53.67 - Holmium atomic config



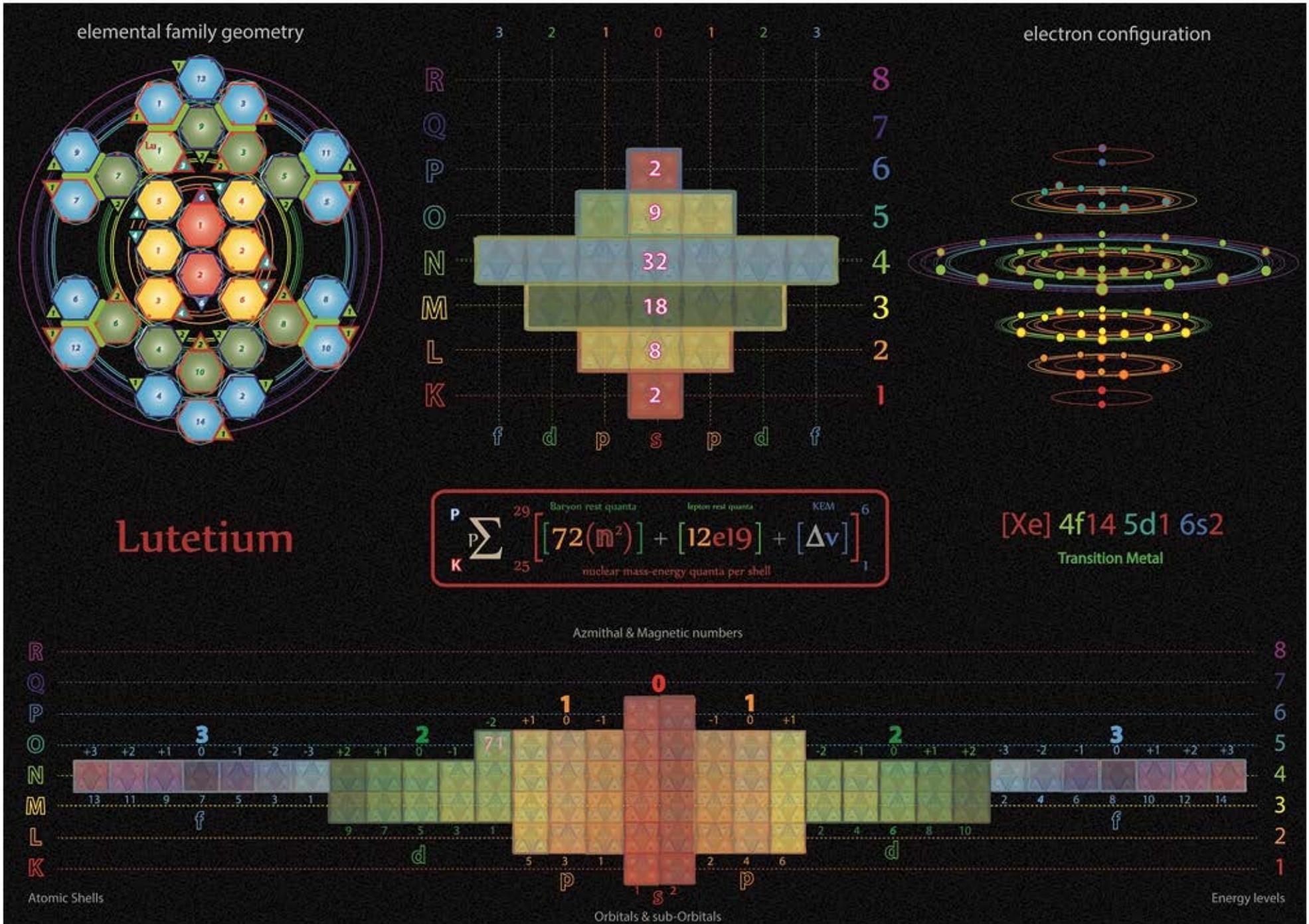
Tetryonics 53.68 - Erbium atomic config



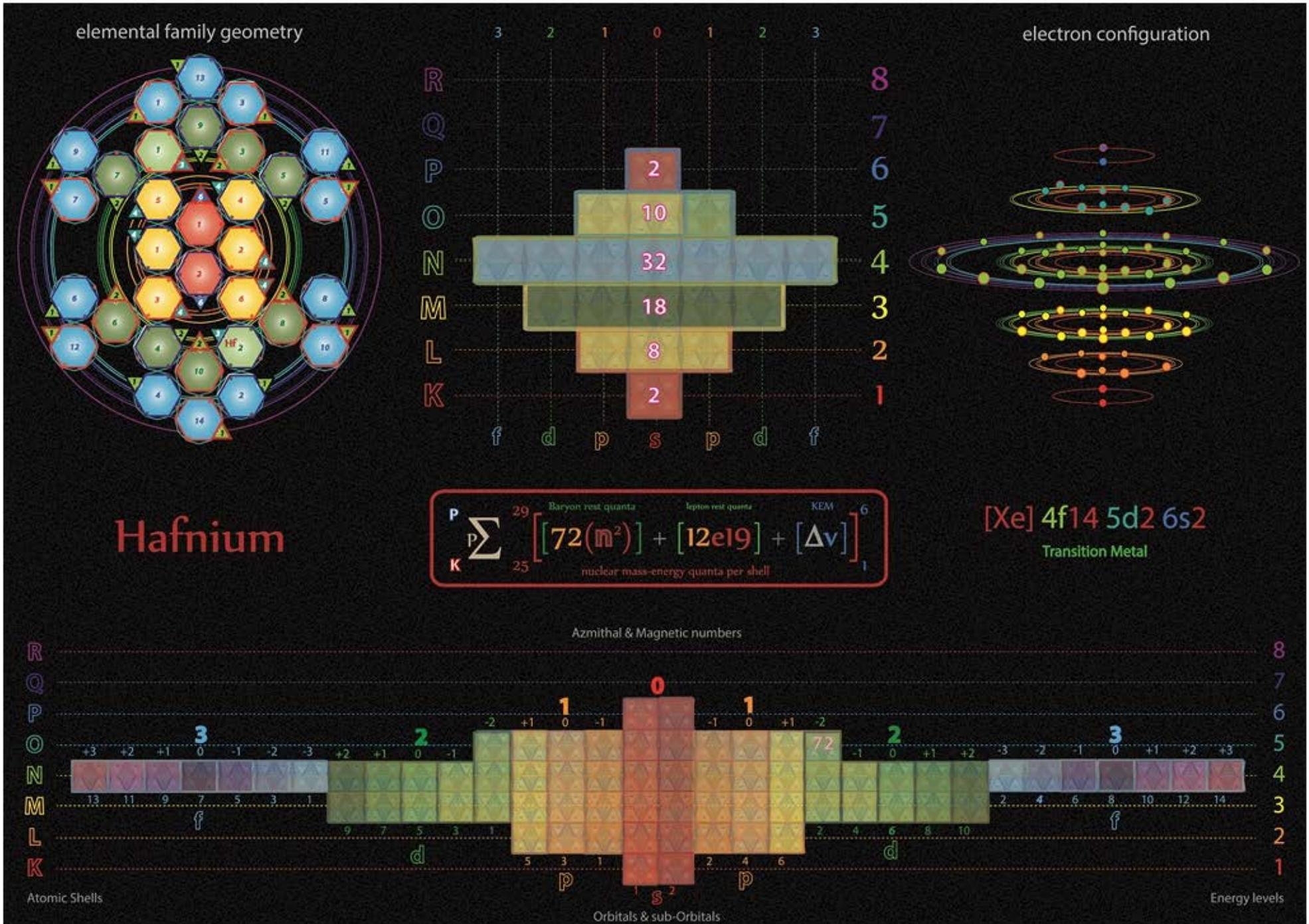
Tetryonics 53.69 - Thulium atomic config



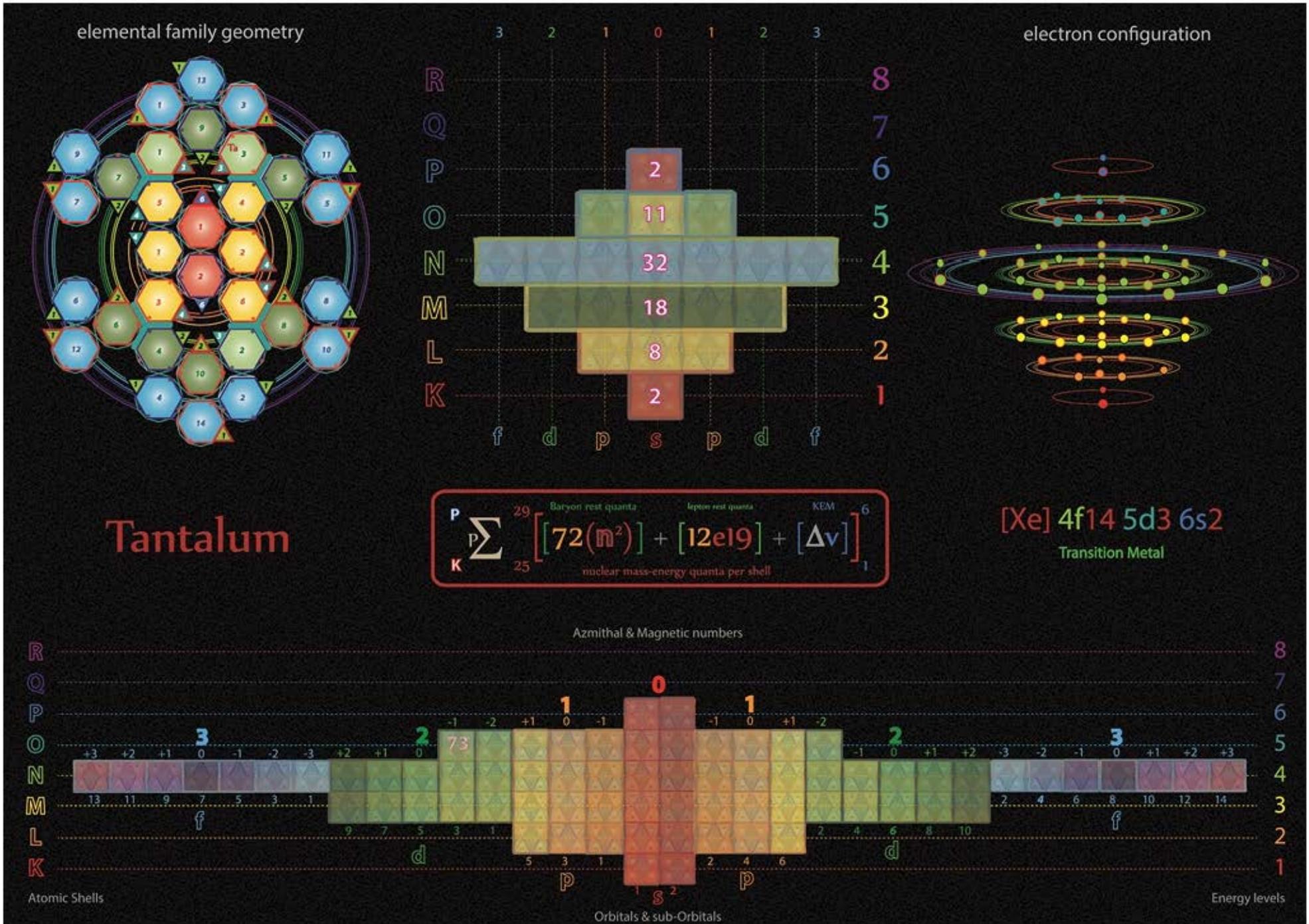
Tetryonics 53.70 - Ytterbium atomic config



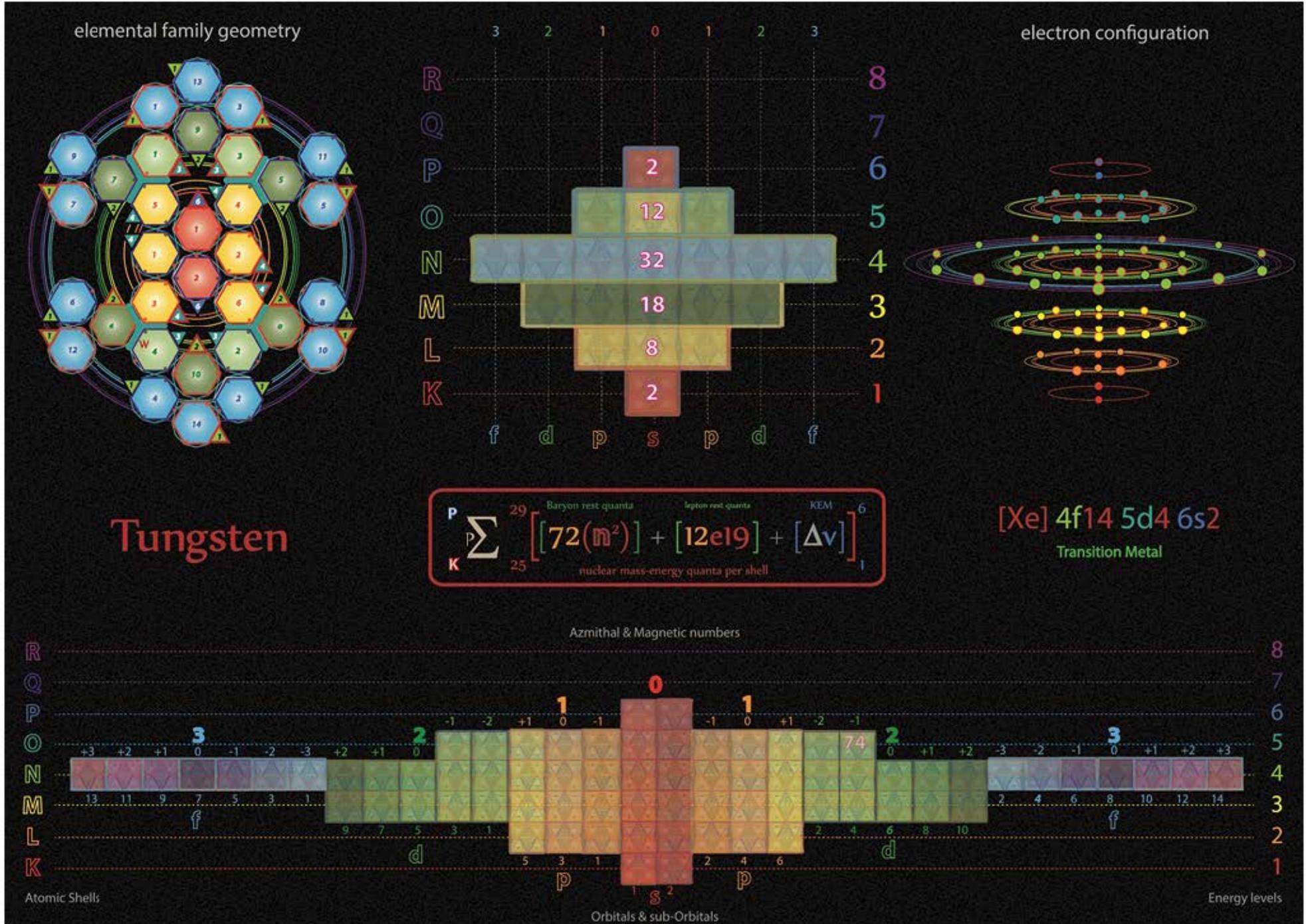
Tetryonics 53.71 - Lutetium atomic config



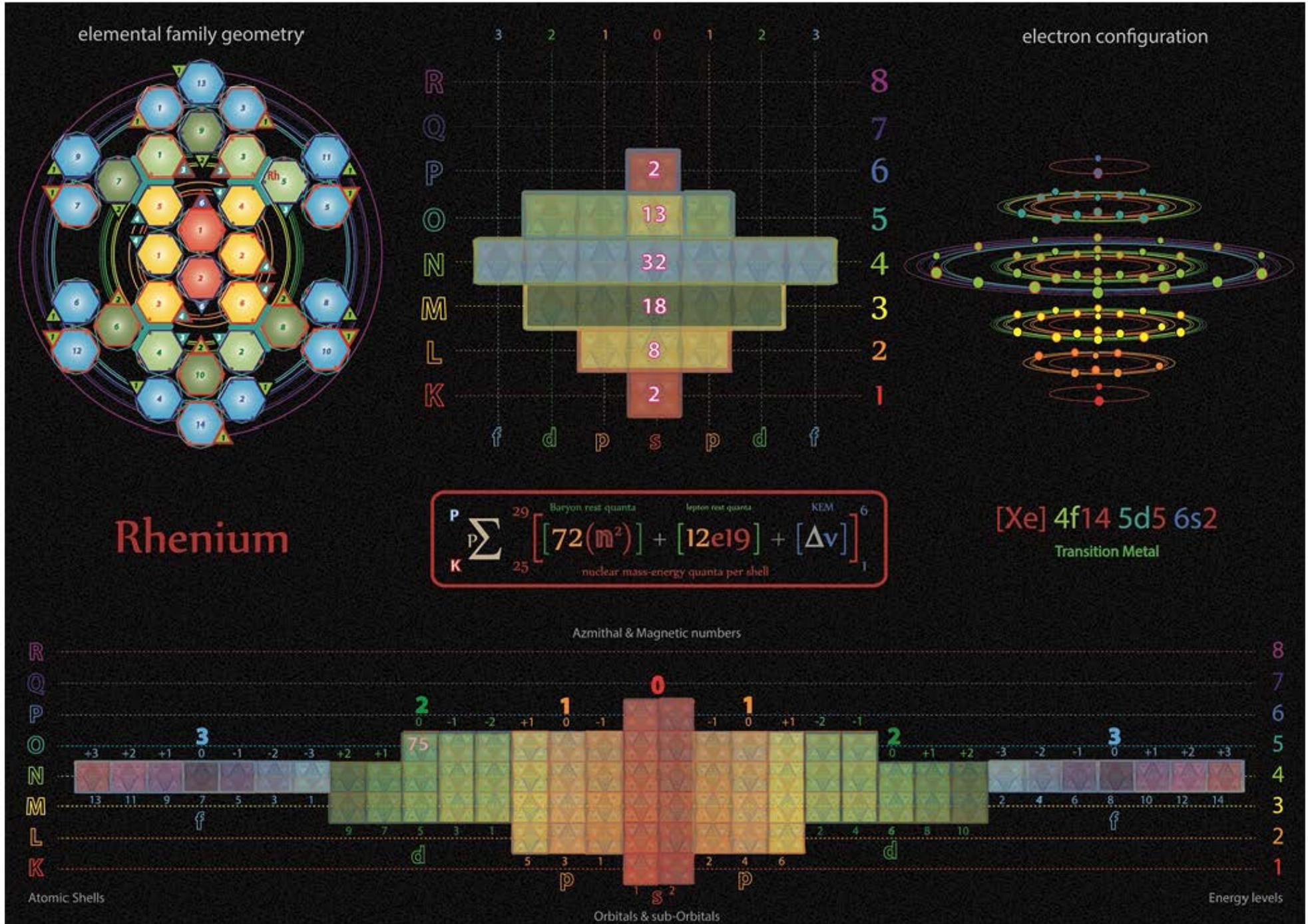
Tetryonics 53.72 - Hafnium atomic config



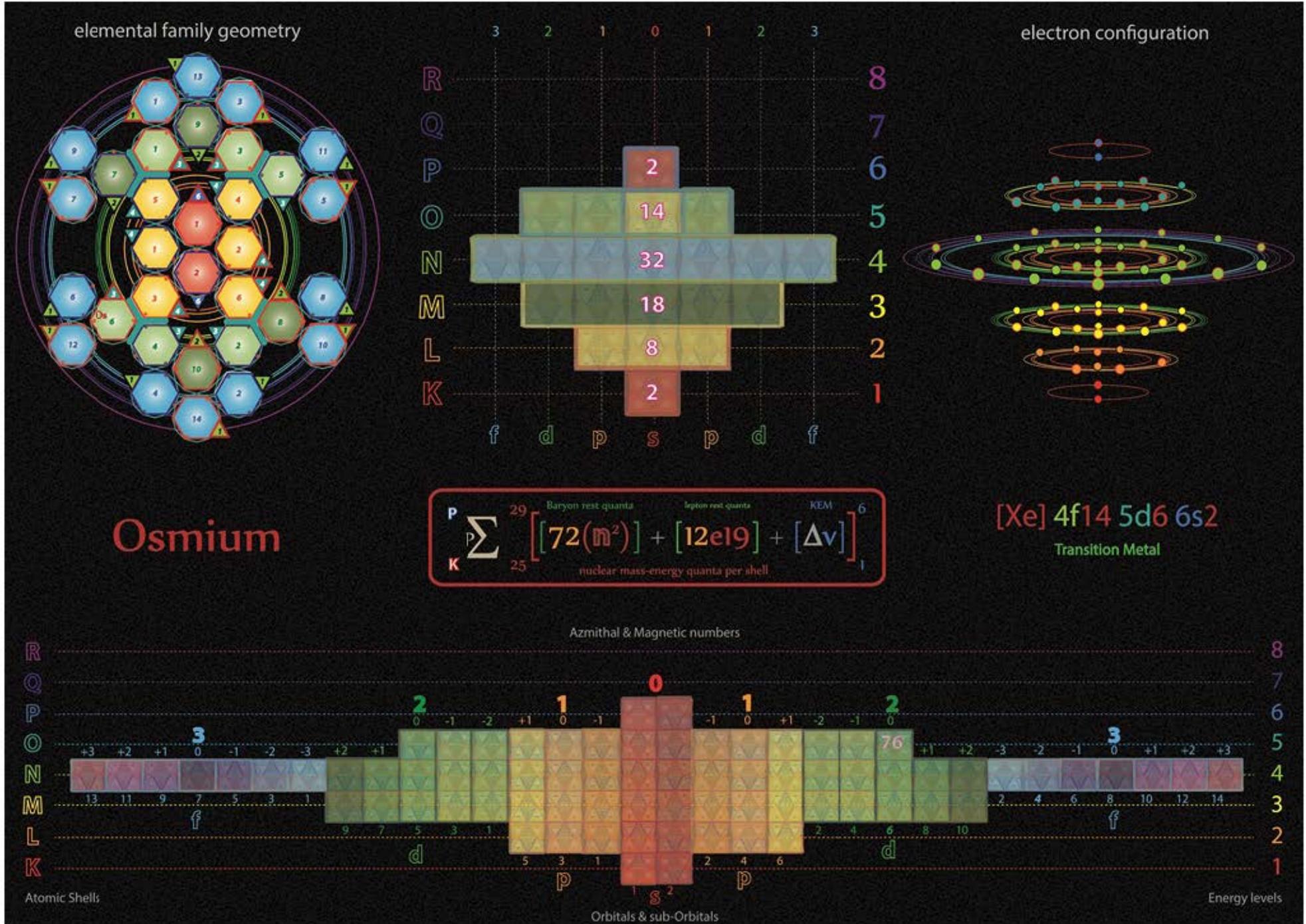
Tetryonics 53.73 - Tantalum atomic config



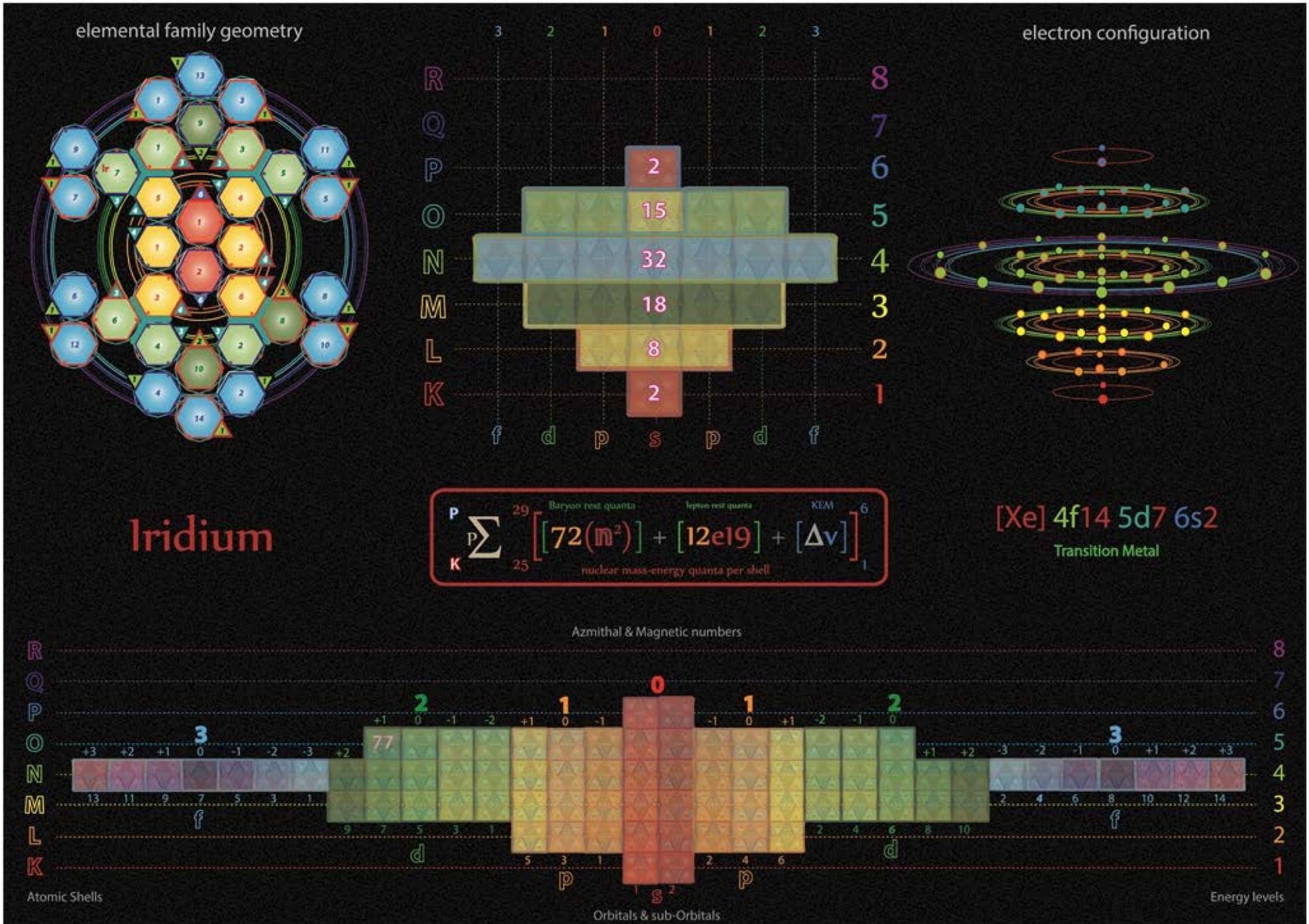
Tetryonics 53.74 - Tungsten atomic config



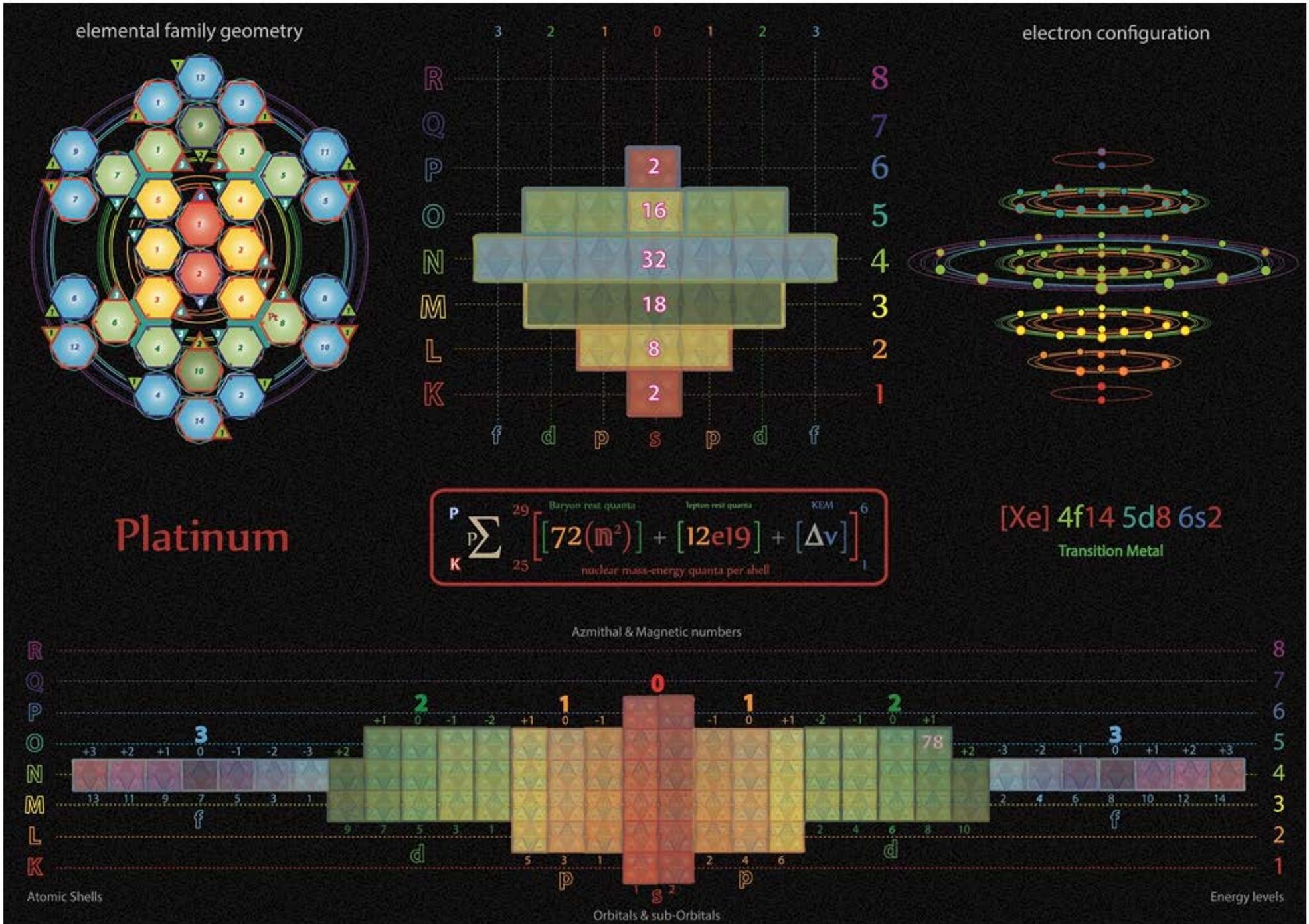
Tetryonics 53.75 - Rhenium atomic config



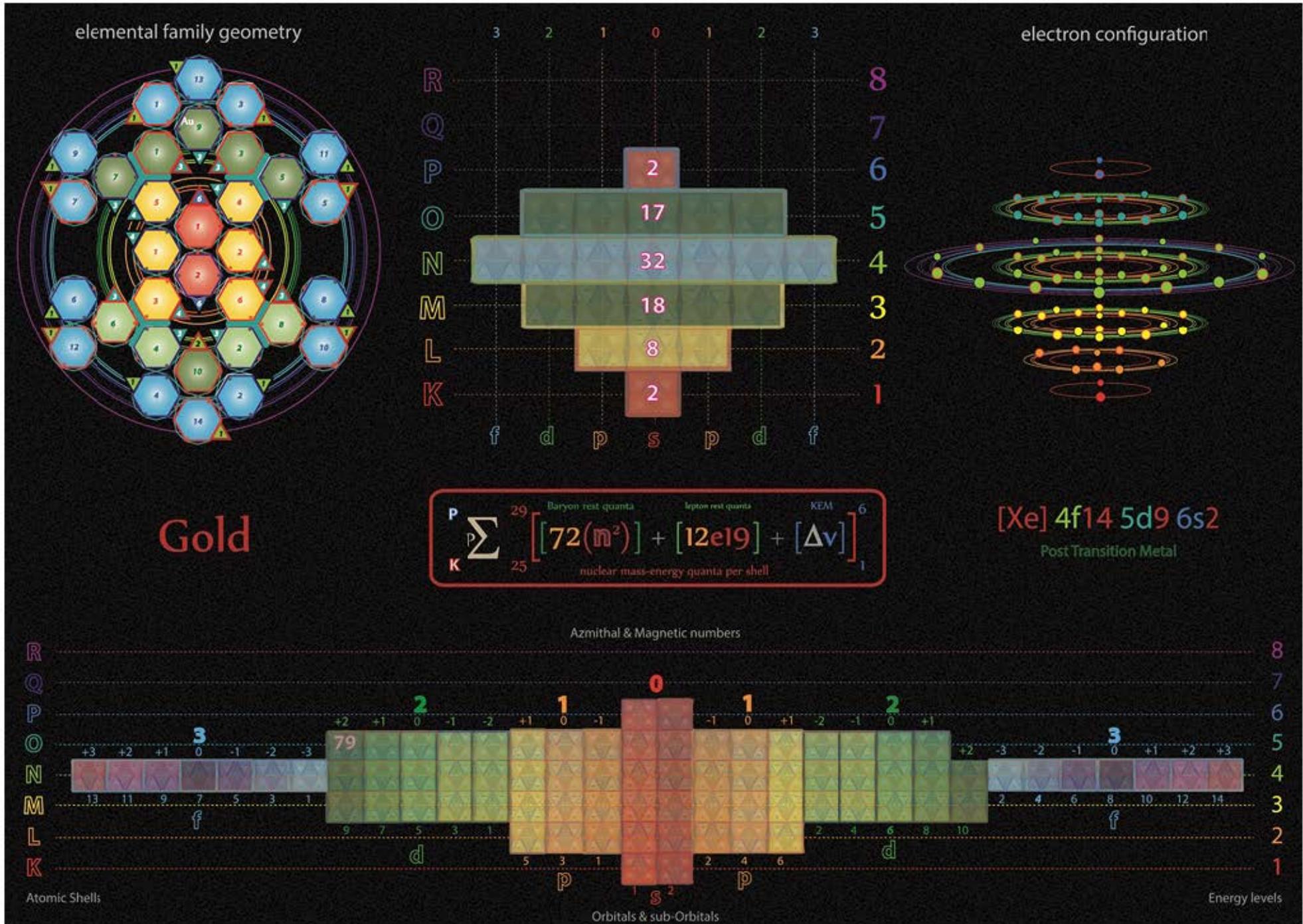
Tetryonics 53.76 - Osmium atomic config



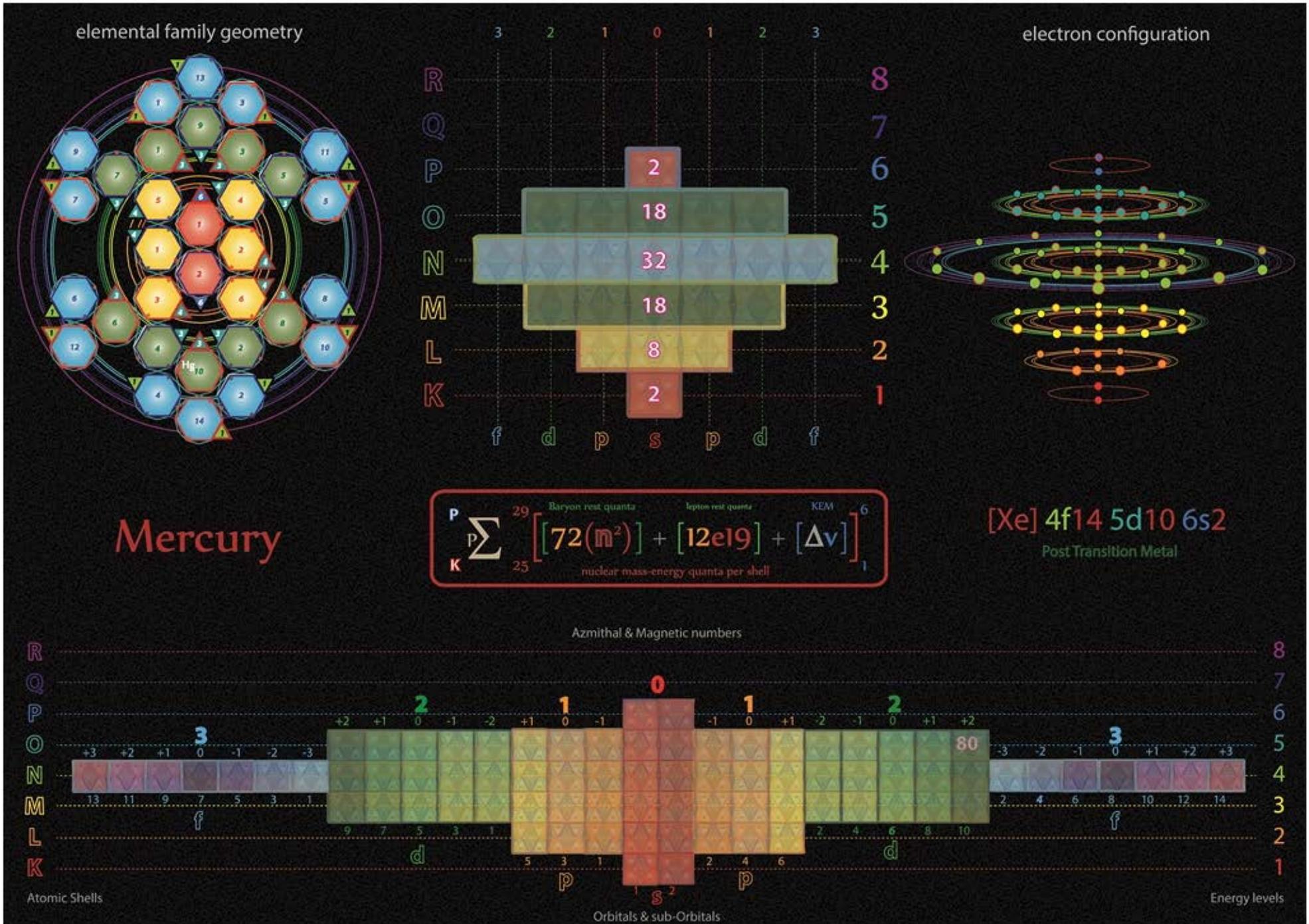
Tetryonics 53.77 - Iridium atomic config



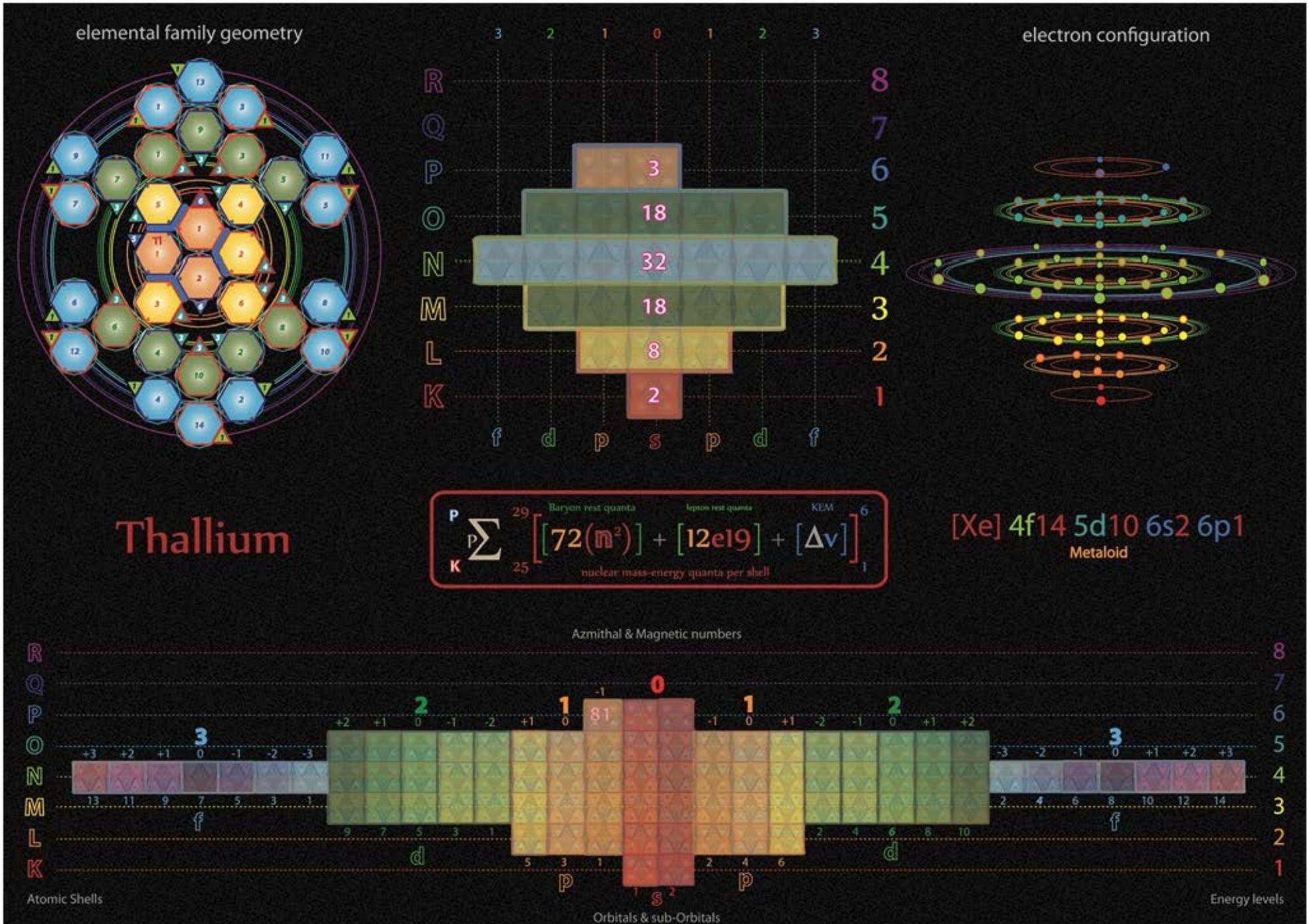
Tetryonics 53.78 - Platinum atomic config



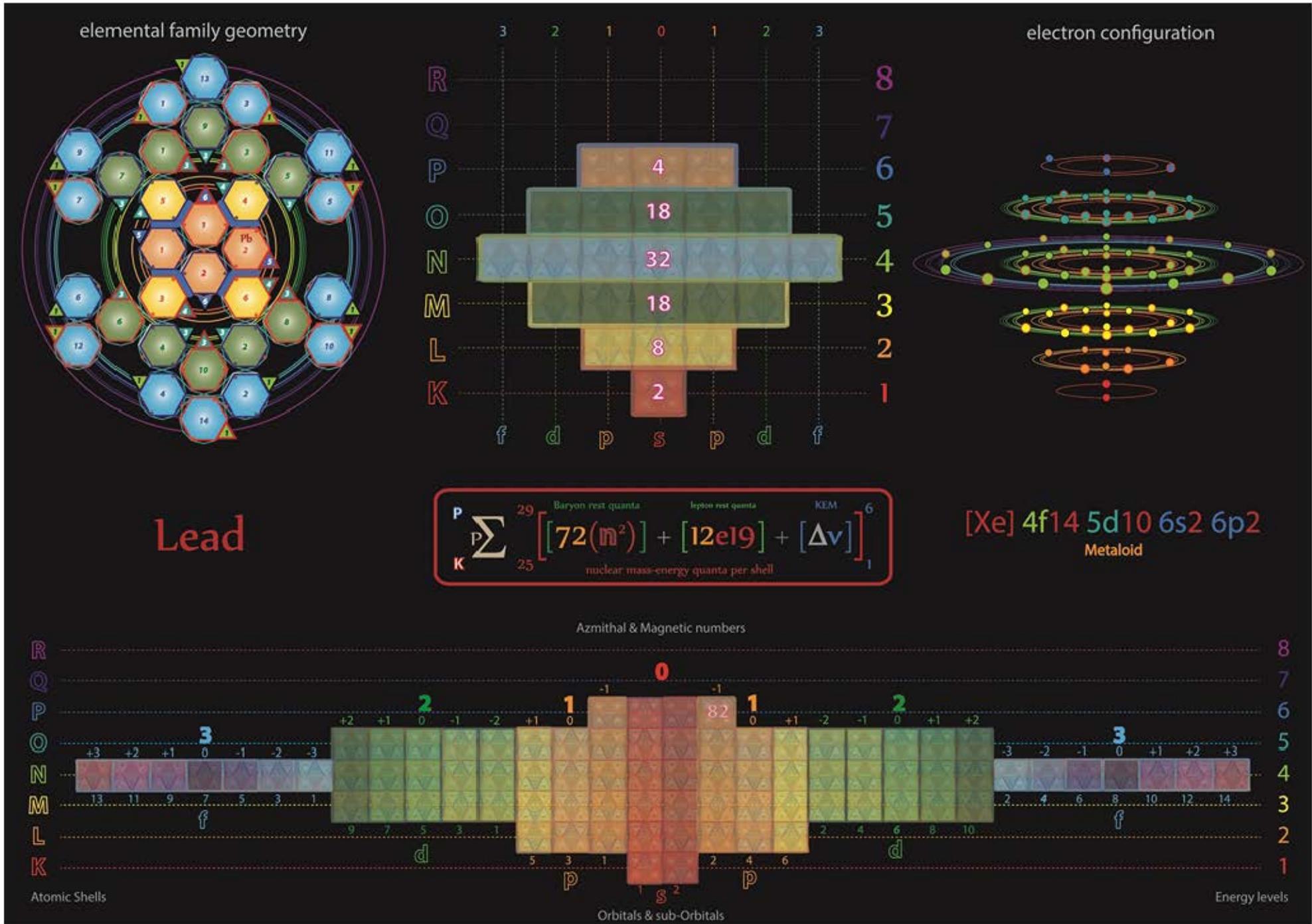
Tetryonics 53.79 - Gold atomic config



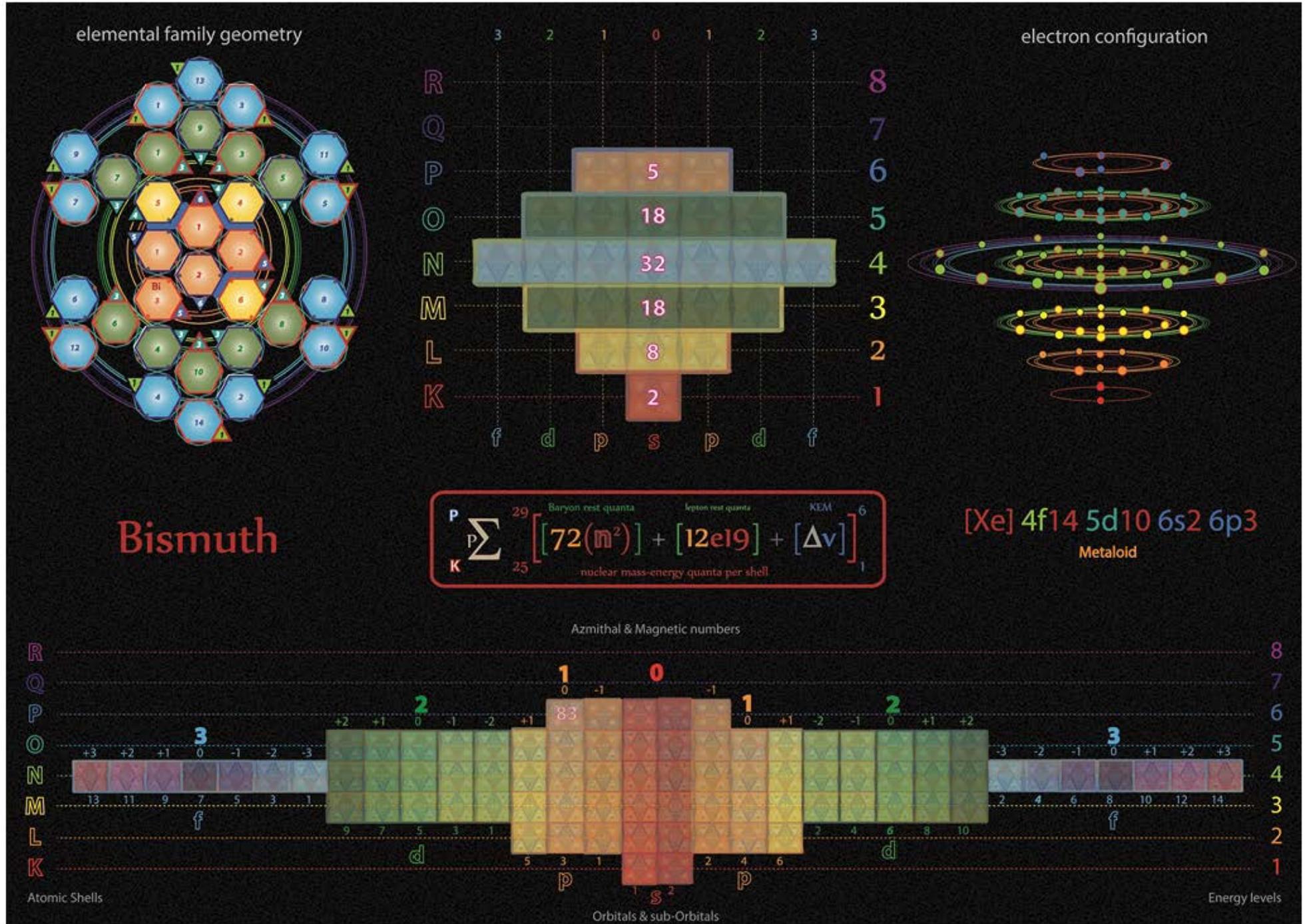
Tetryonics 53.80 - Mercury atomic config



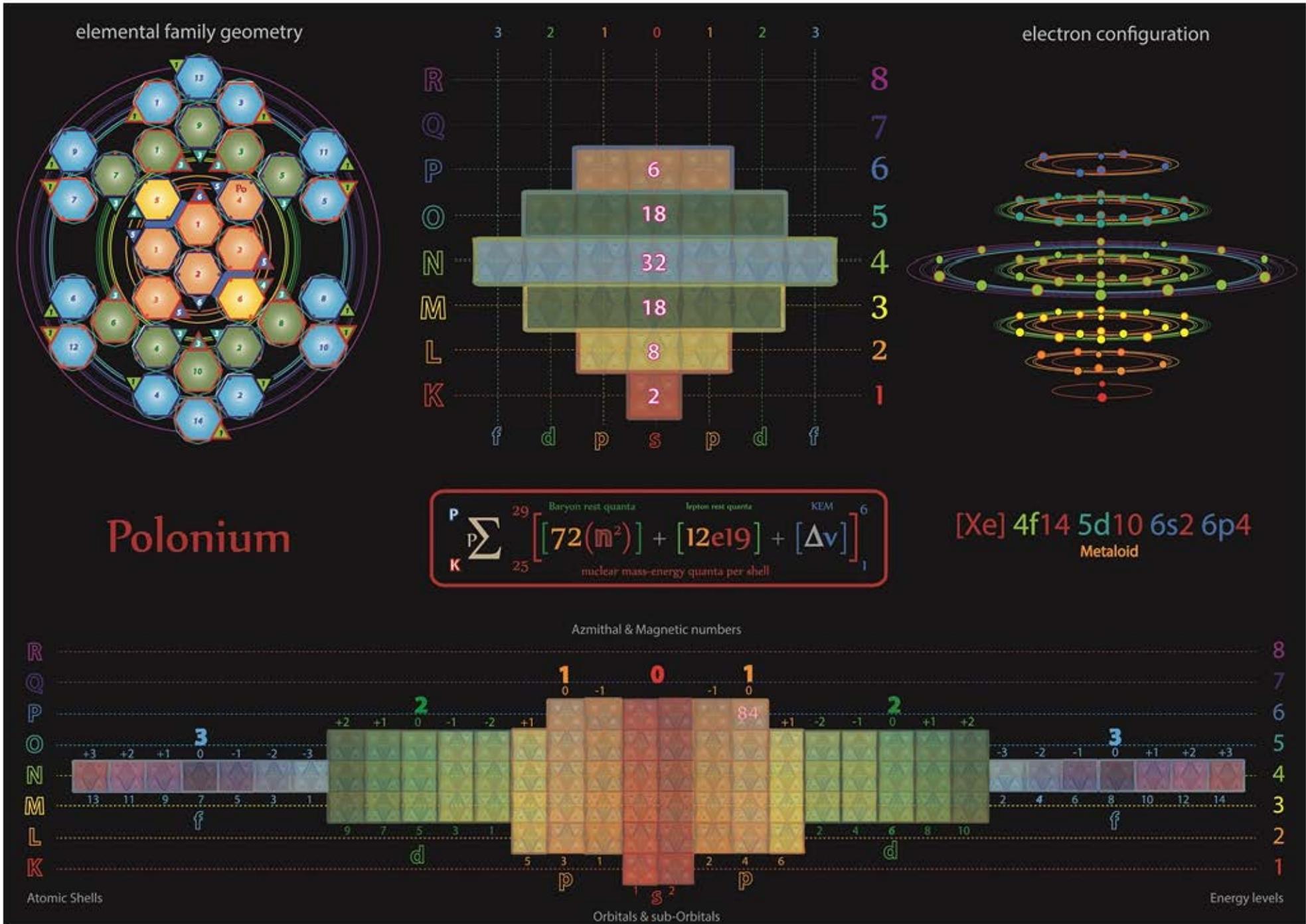
Tetryonics 53.81 - Thallium atomic config



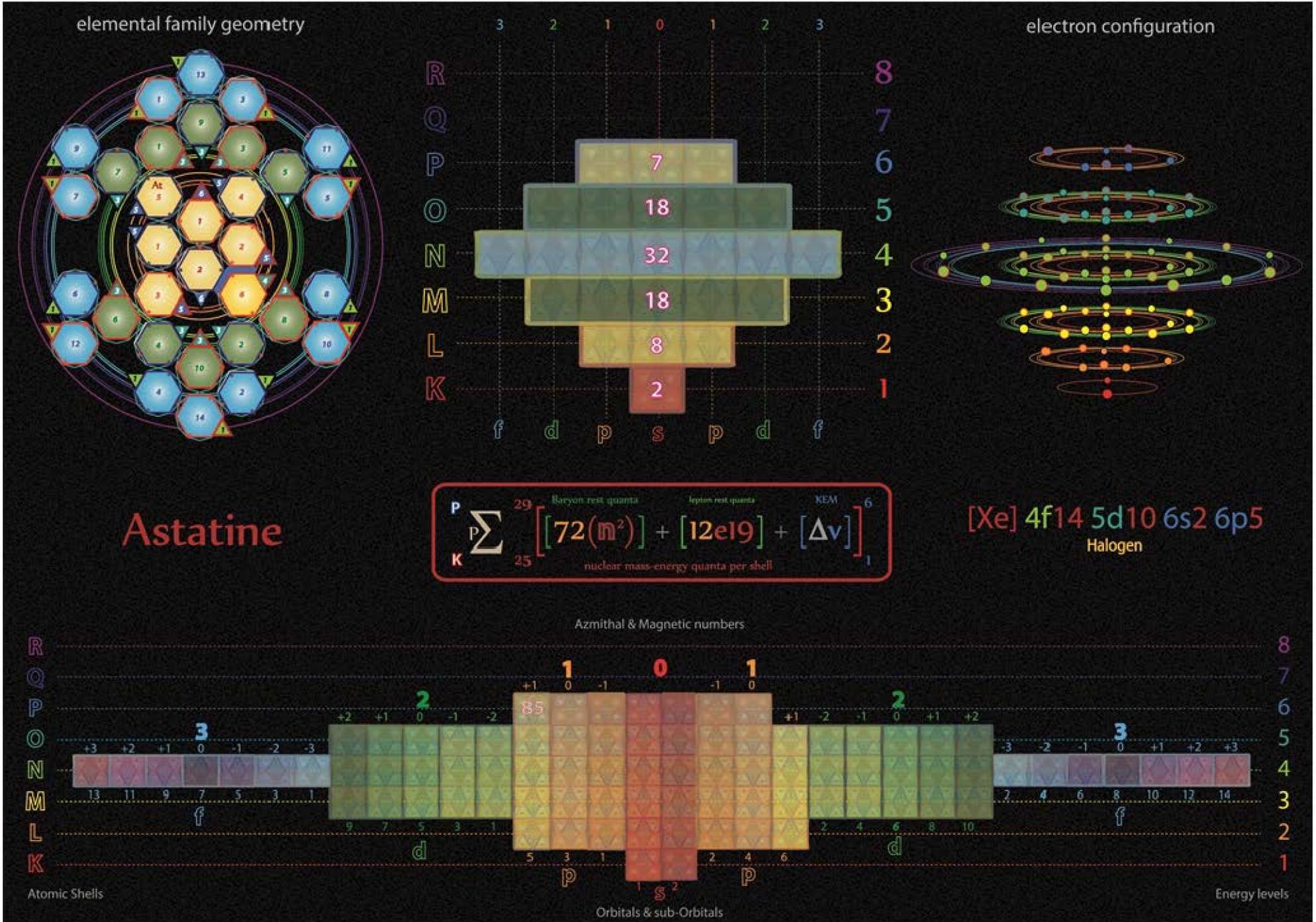
Tetryonics 53.82 - Lead atomic config



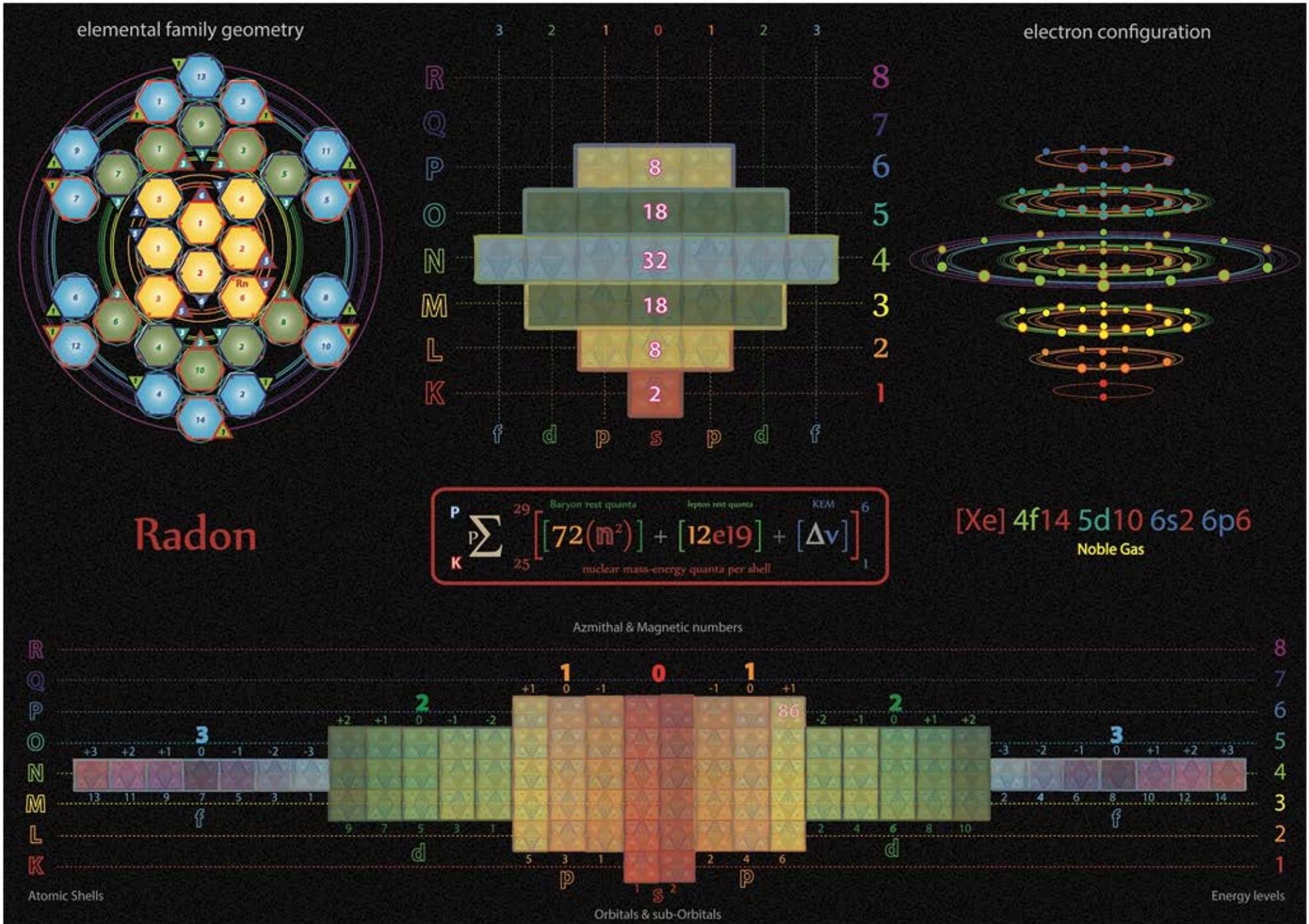
Tetryonics 53.83 - Bismuth atomic config



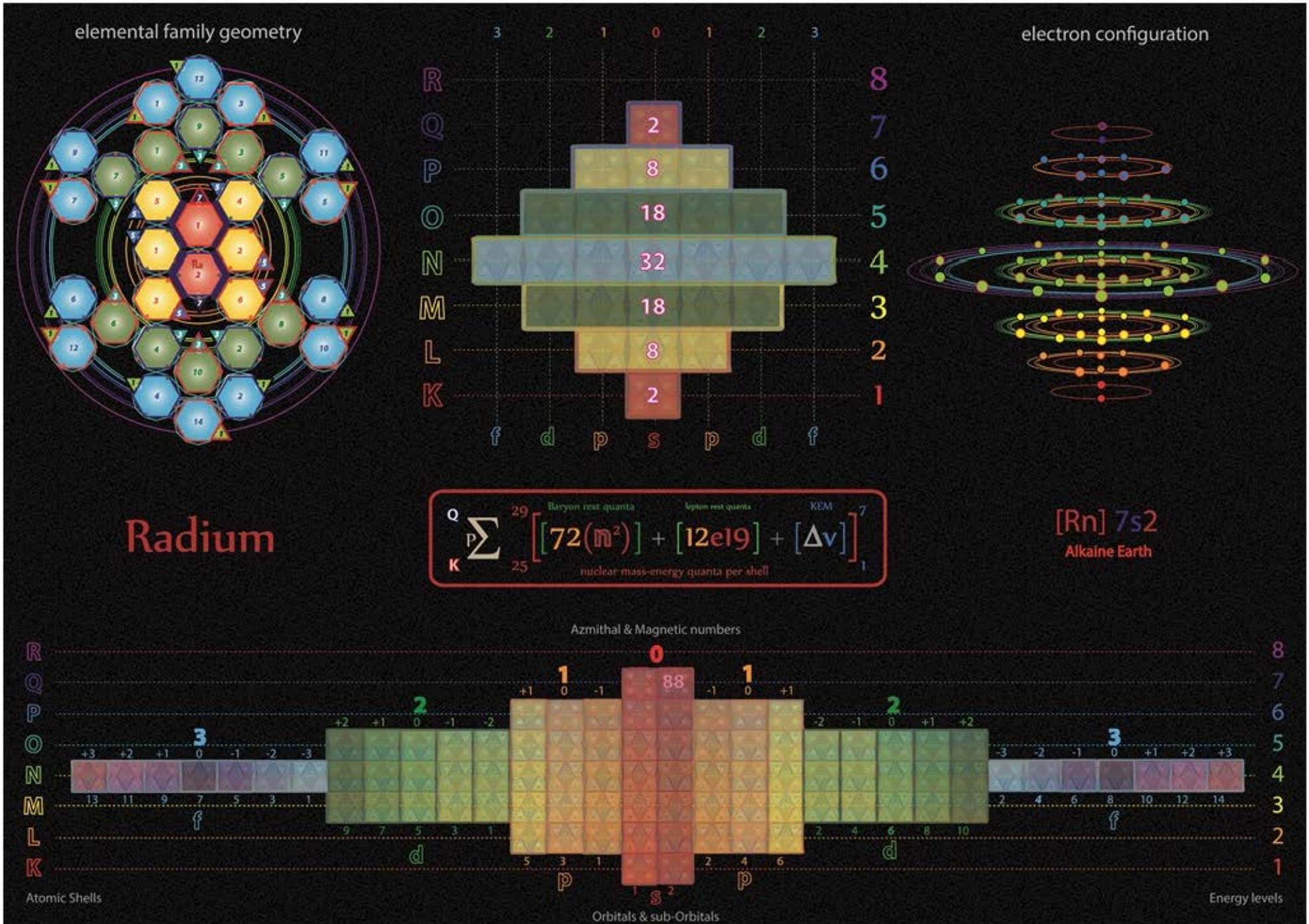
Tetryonics 53.84 - Polonium atomic config



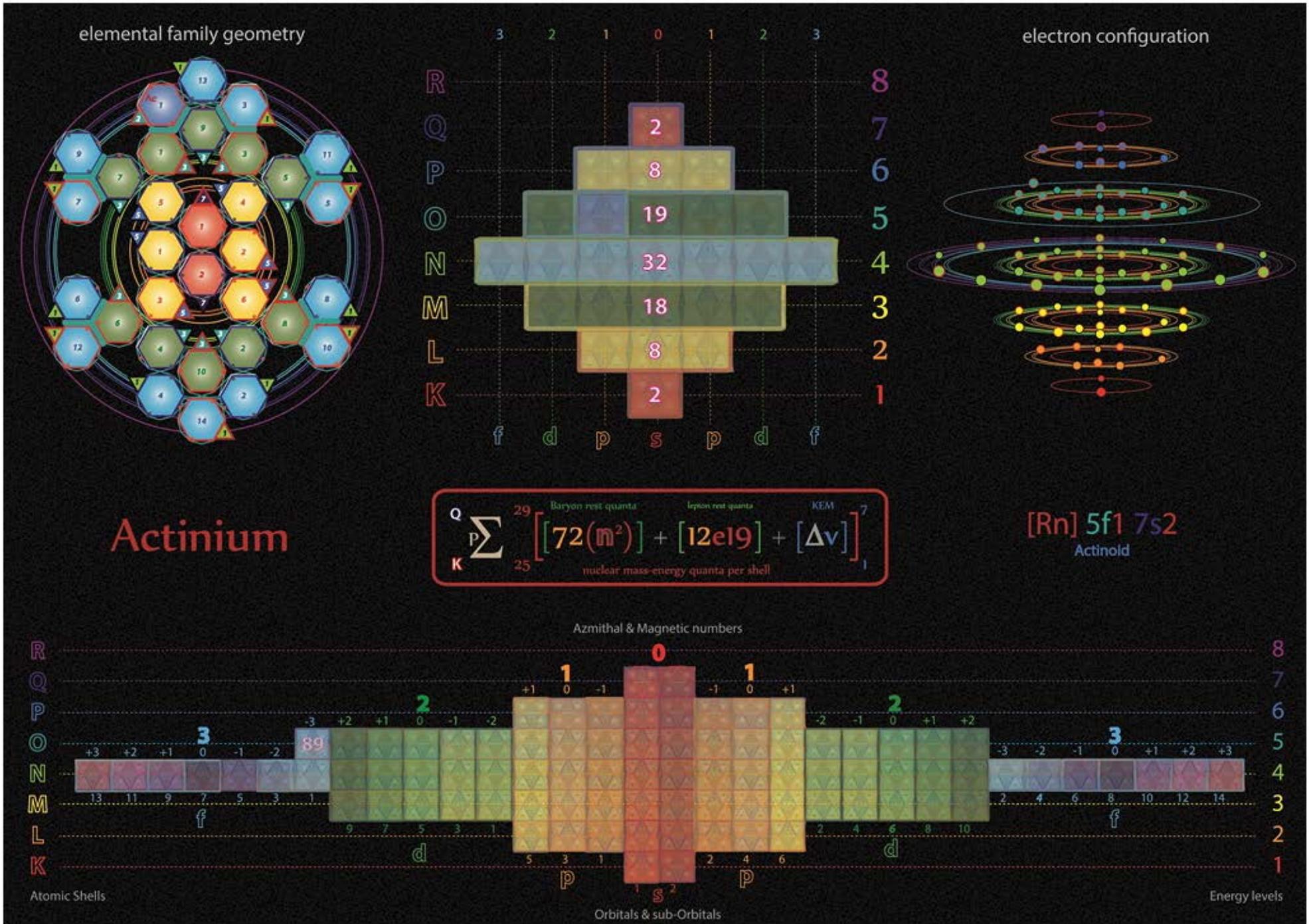
Tetryonics 53.85 - Astatine atomic config



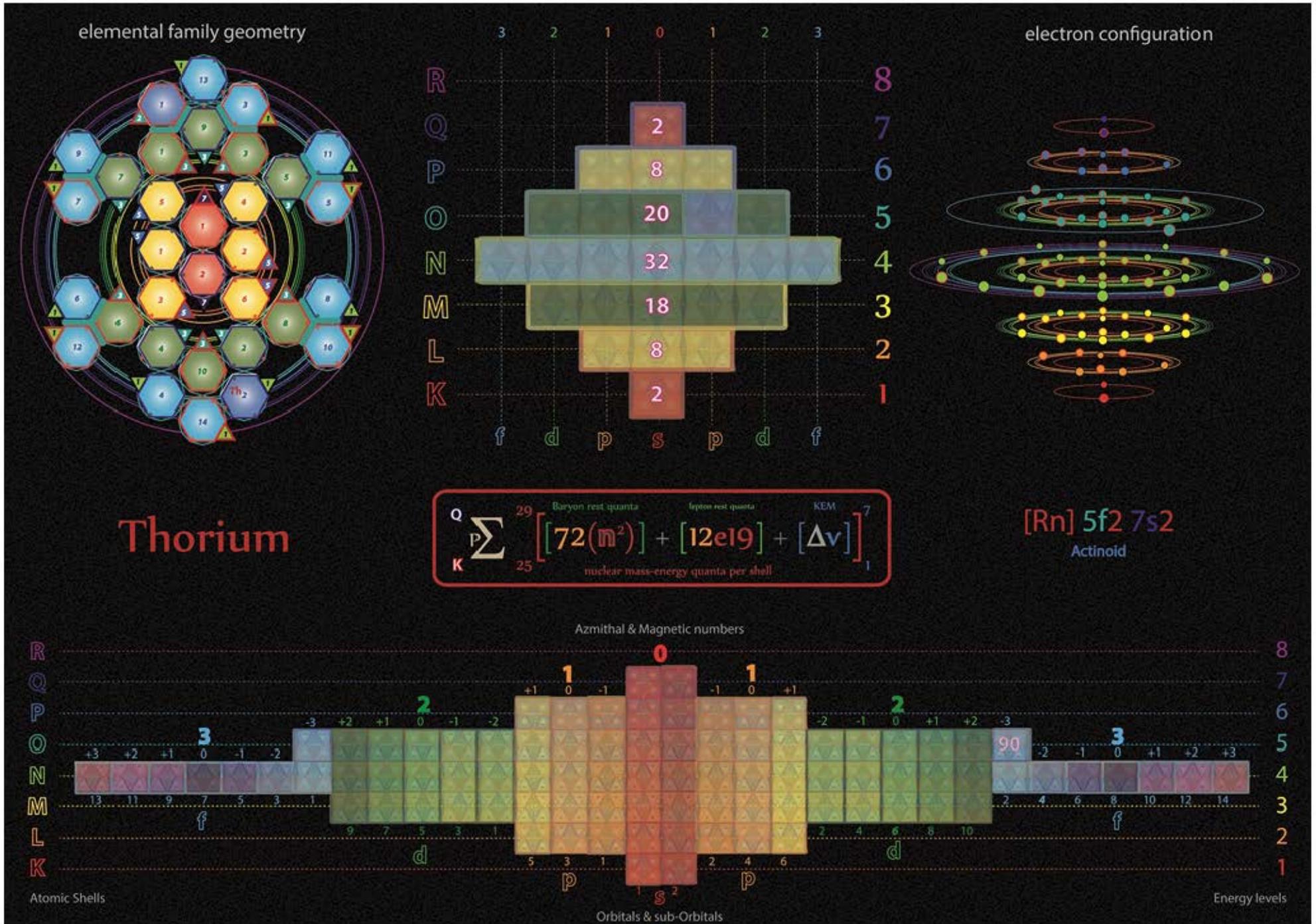
Tetryonics 53.86 - Radon atomic config



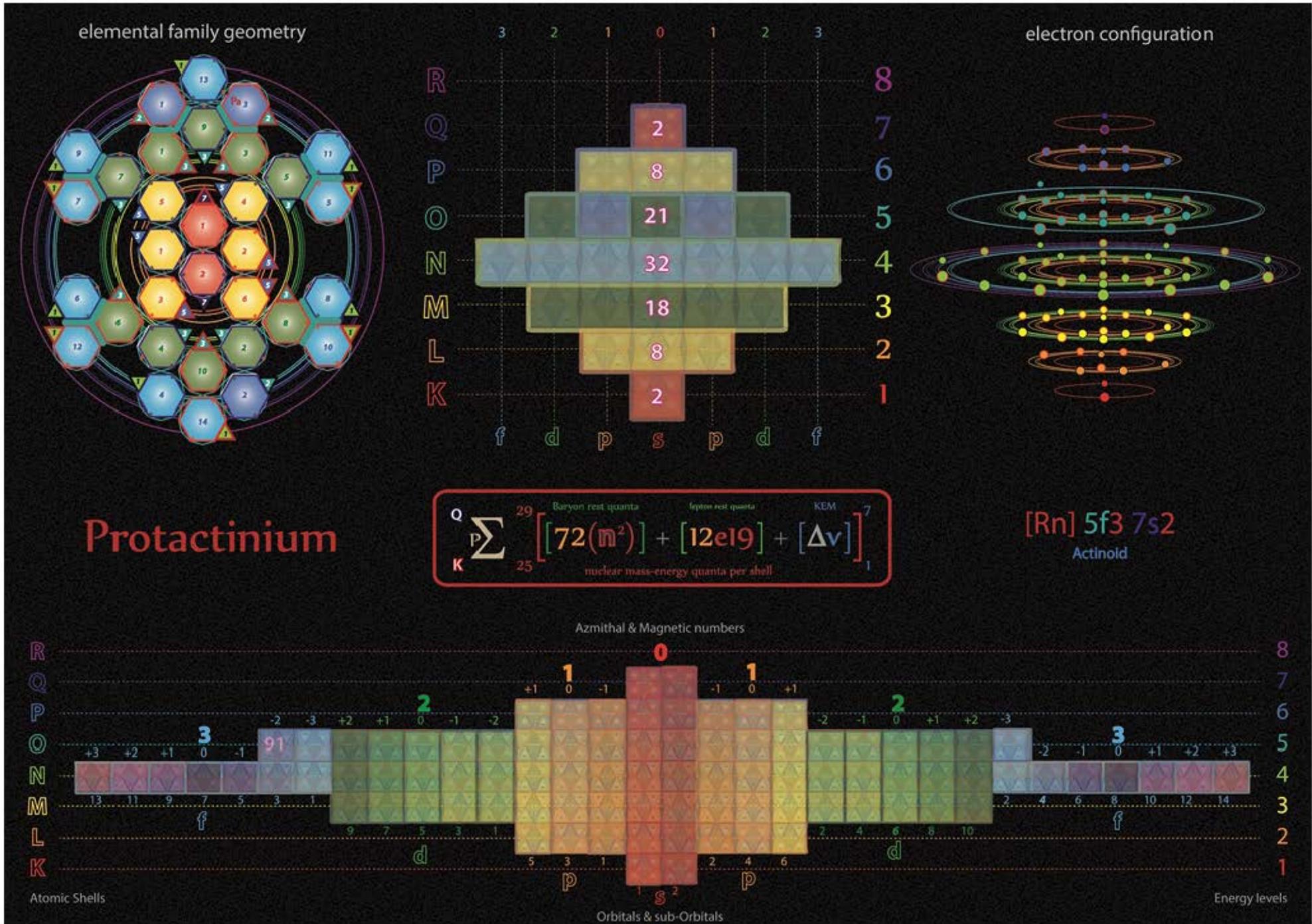
Tetryonics 53.88 - Radium atomic config



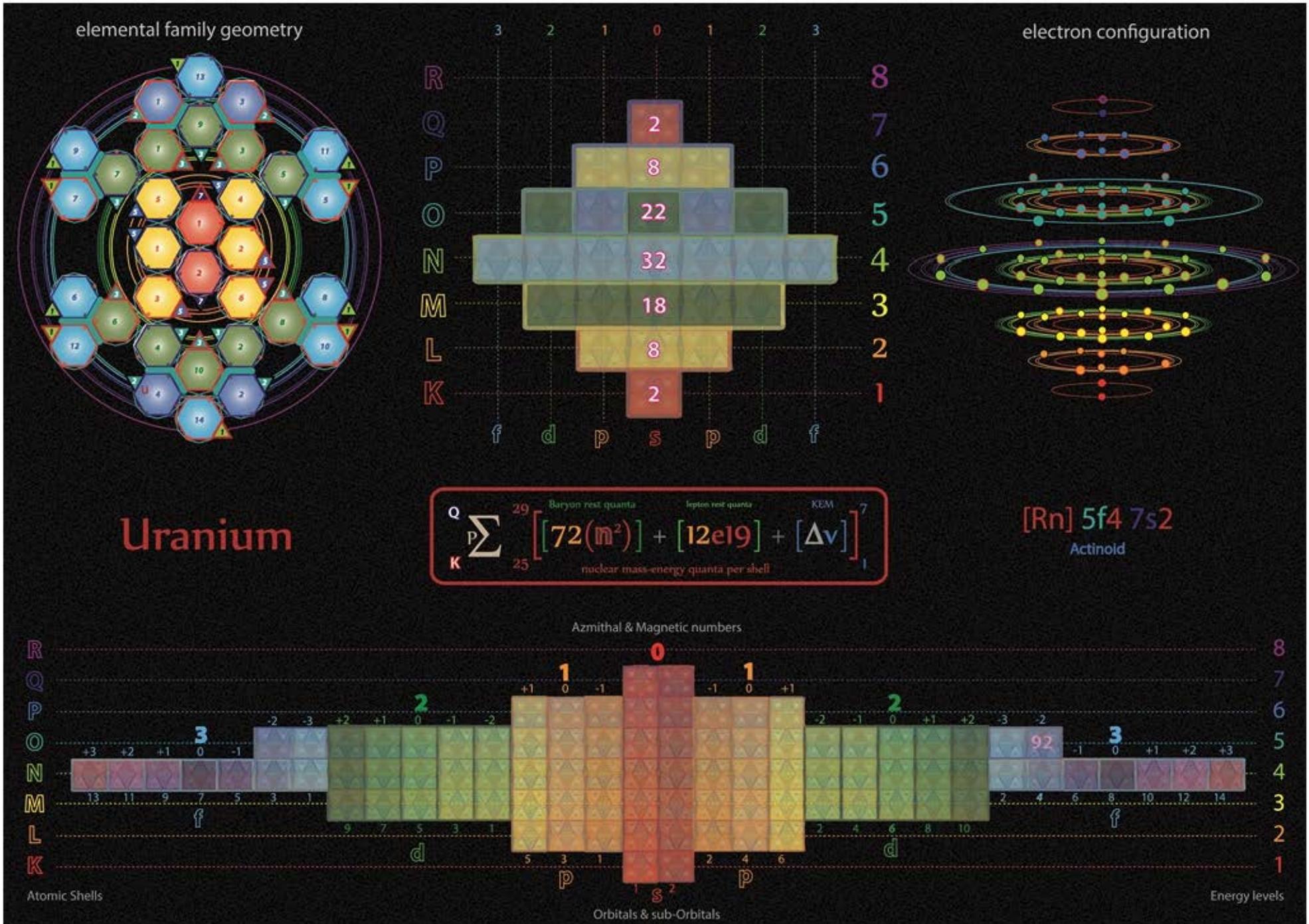
Tetryonics 53.89 - Actinium atomic config



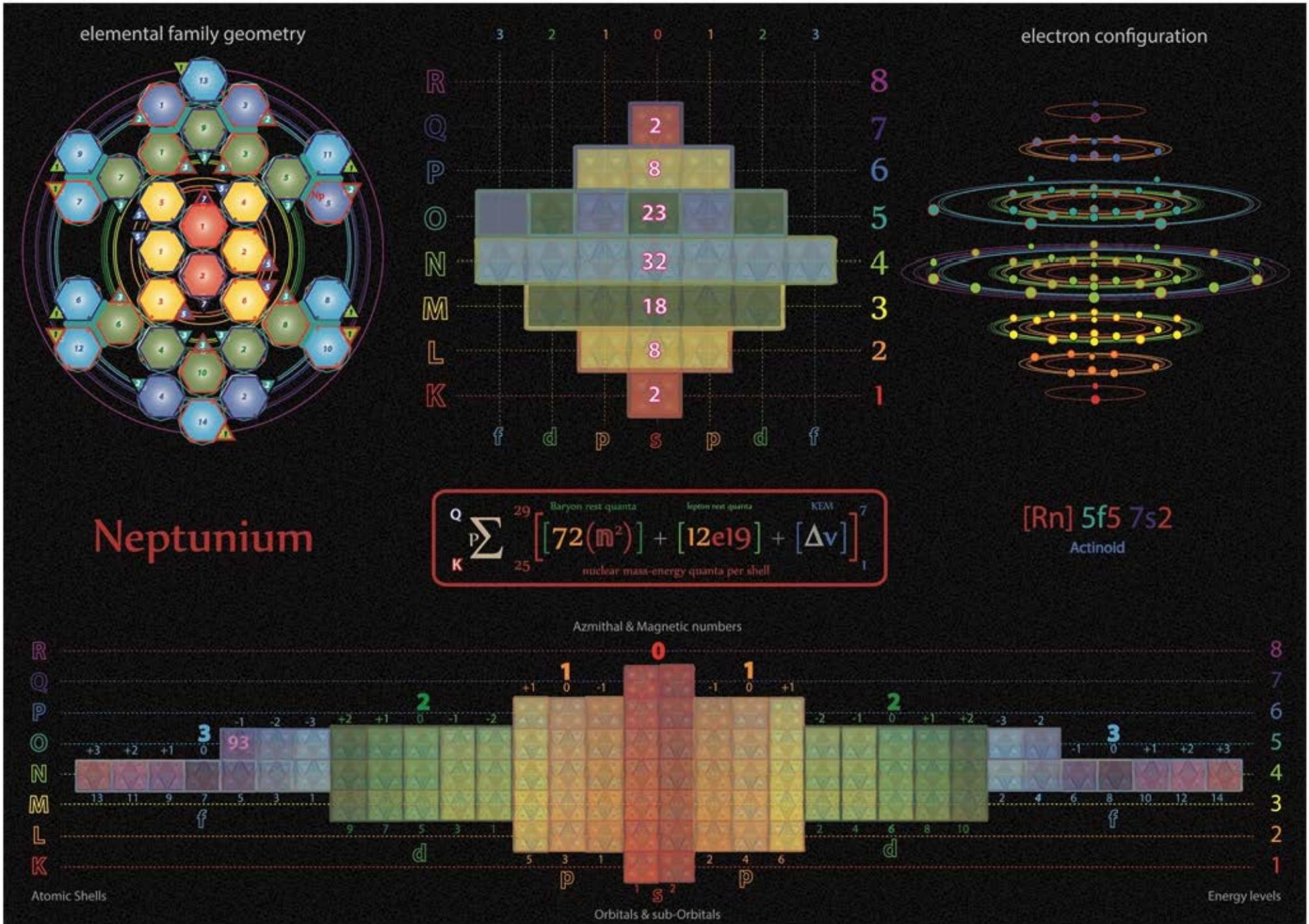
Tetryonics 53.90 - Thorium atomic config



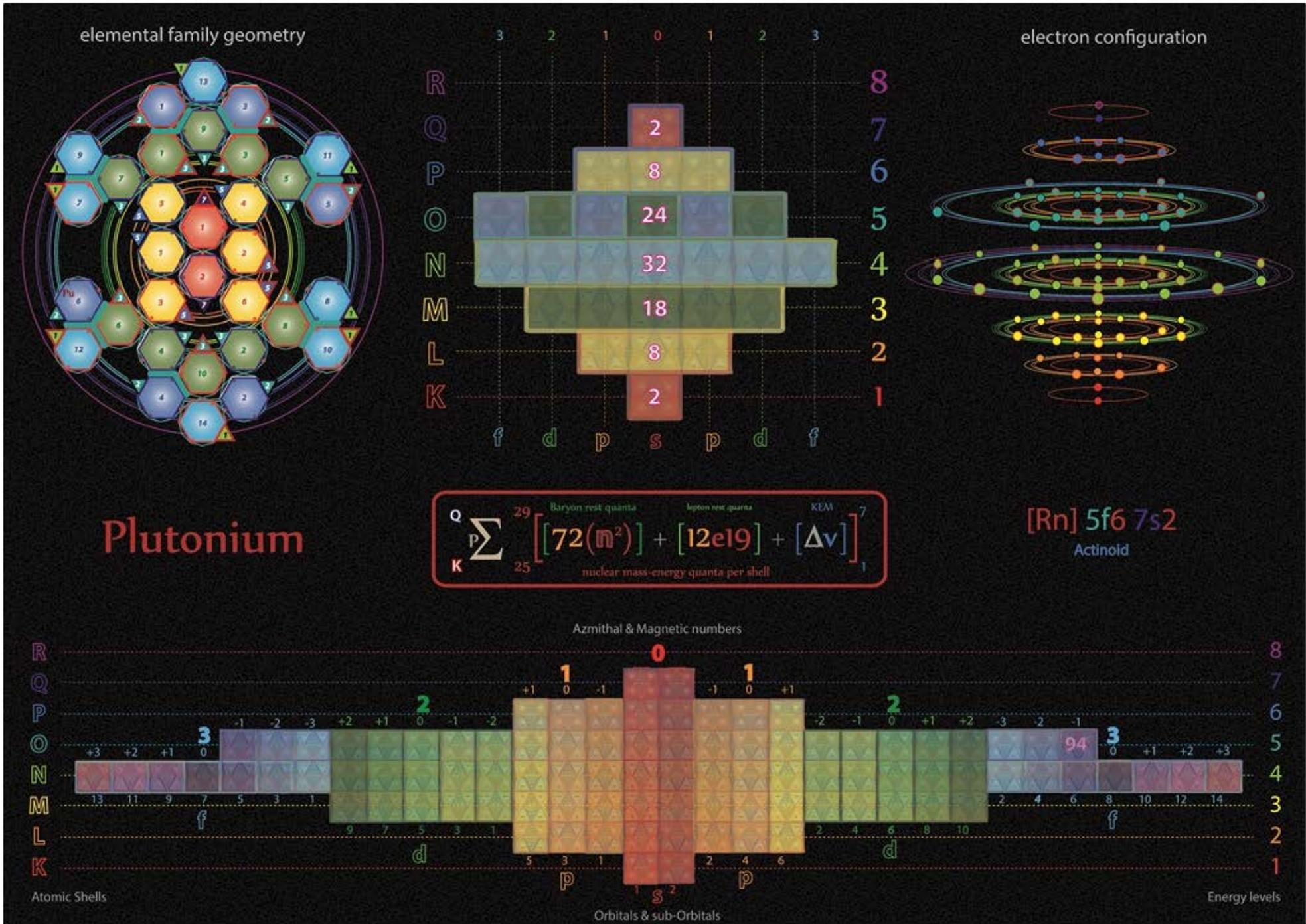
Tetryonics 53.91 - Protactinium atomic config



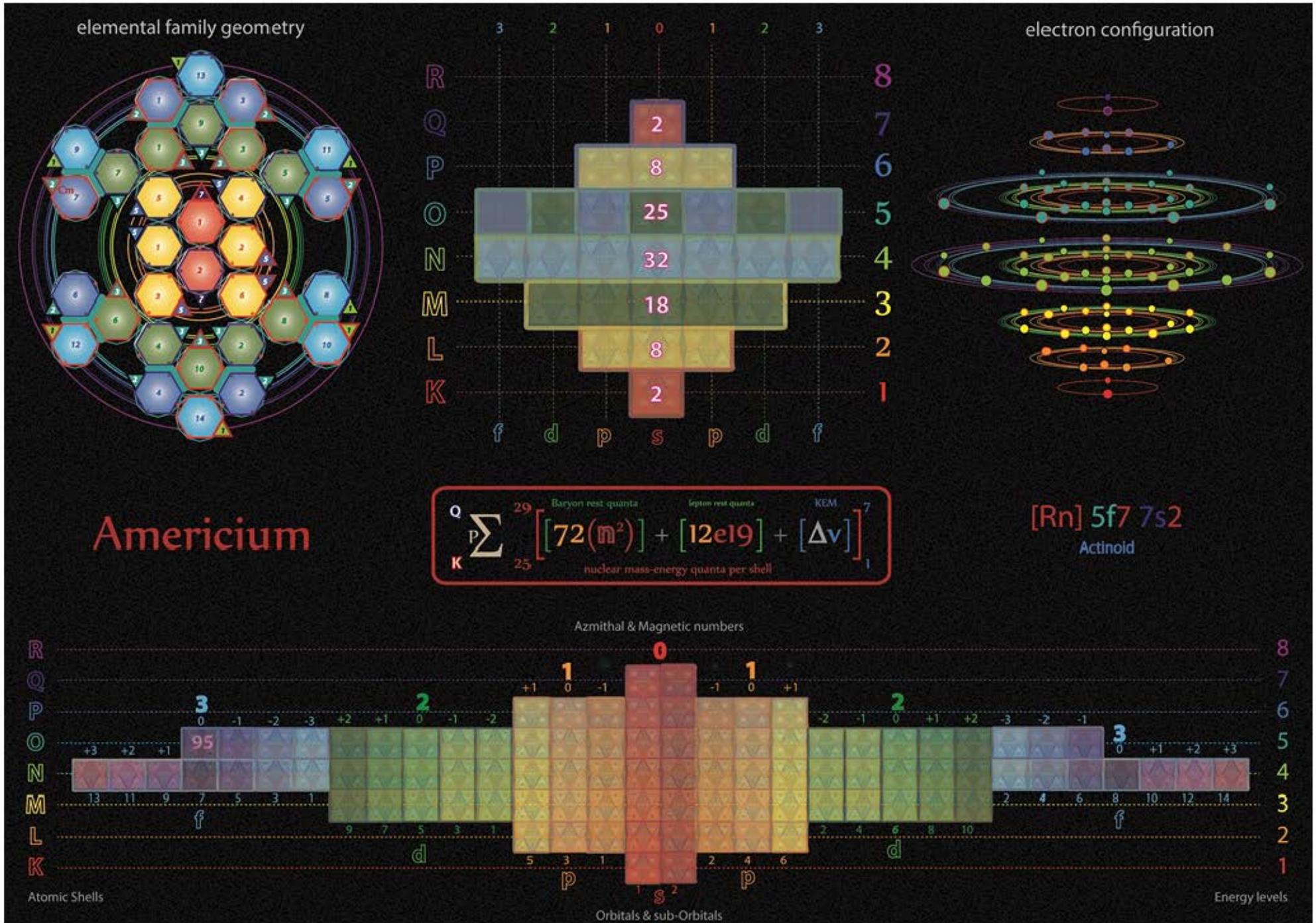
Tetryonics 53.92 - Uranium atomic config



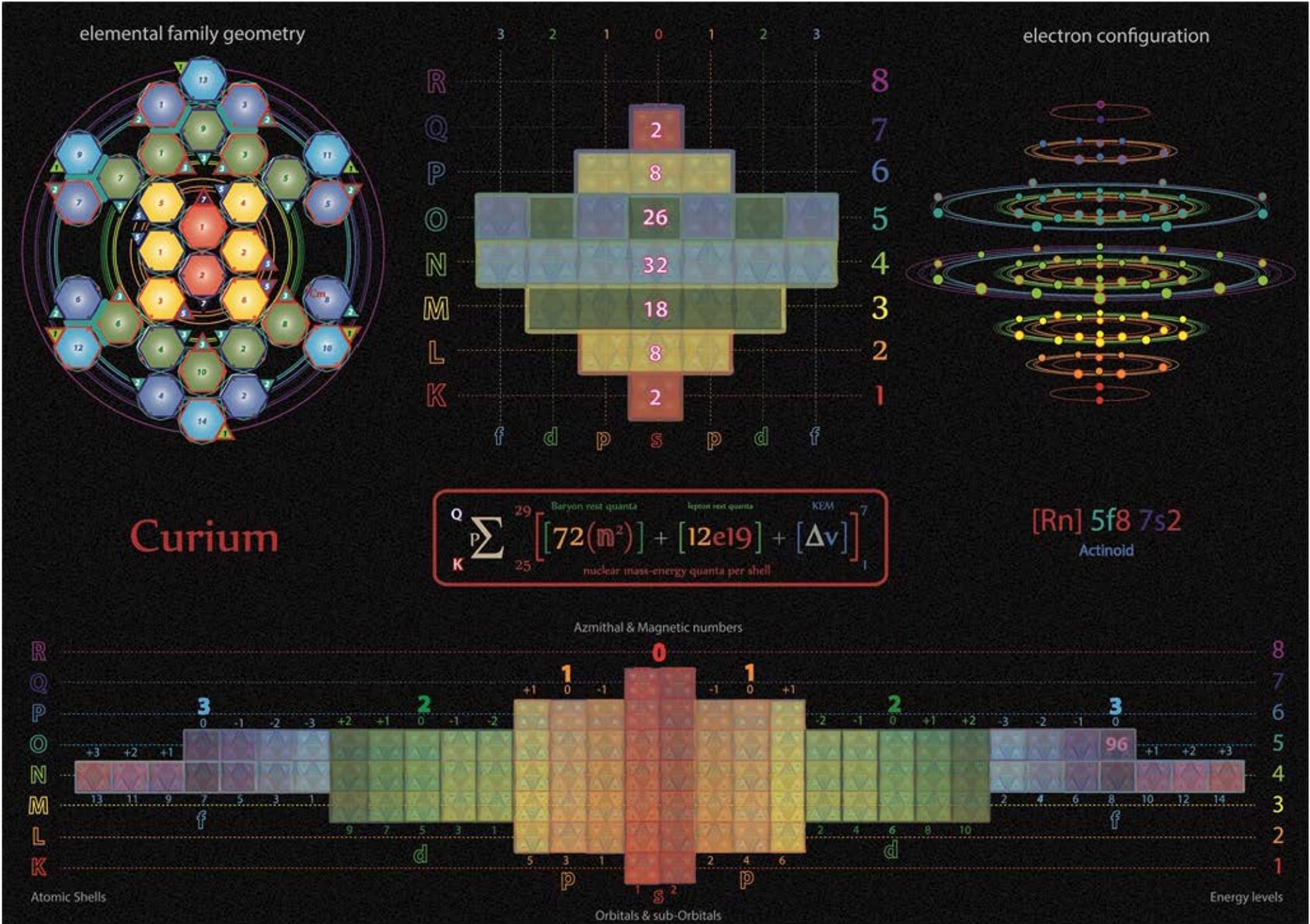
Tetryonics 53.93 - Neptunium atomic config



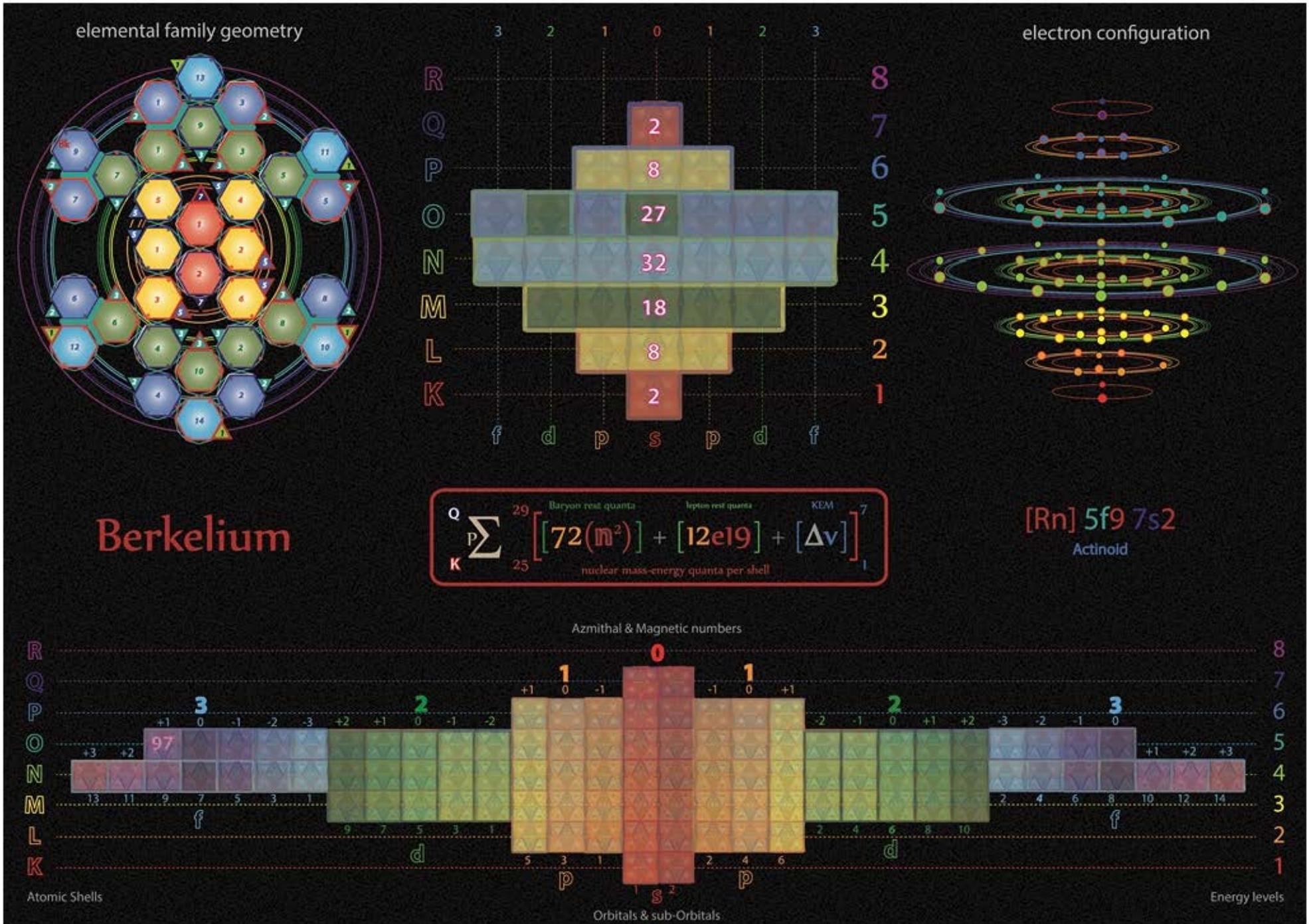
Tetryonics 53.94 - Plutonium atomic config



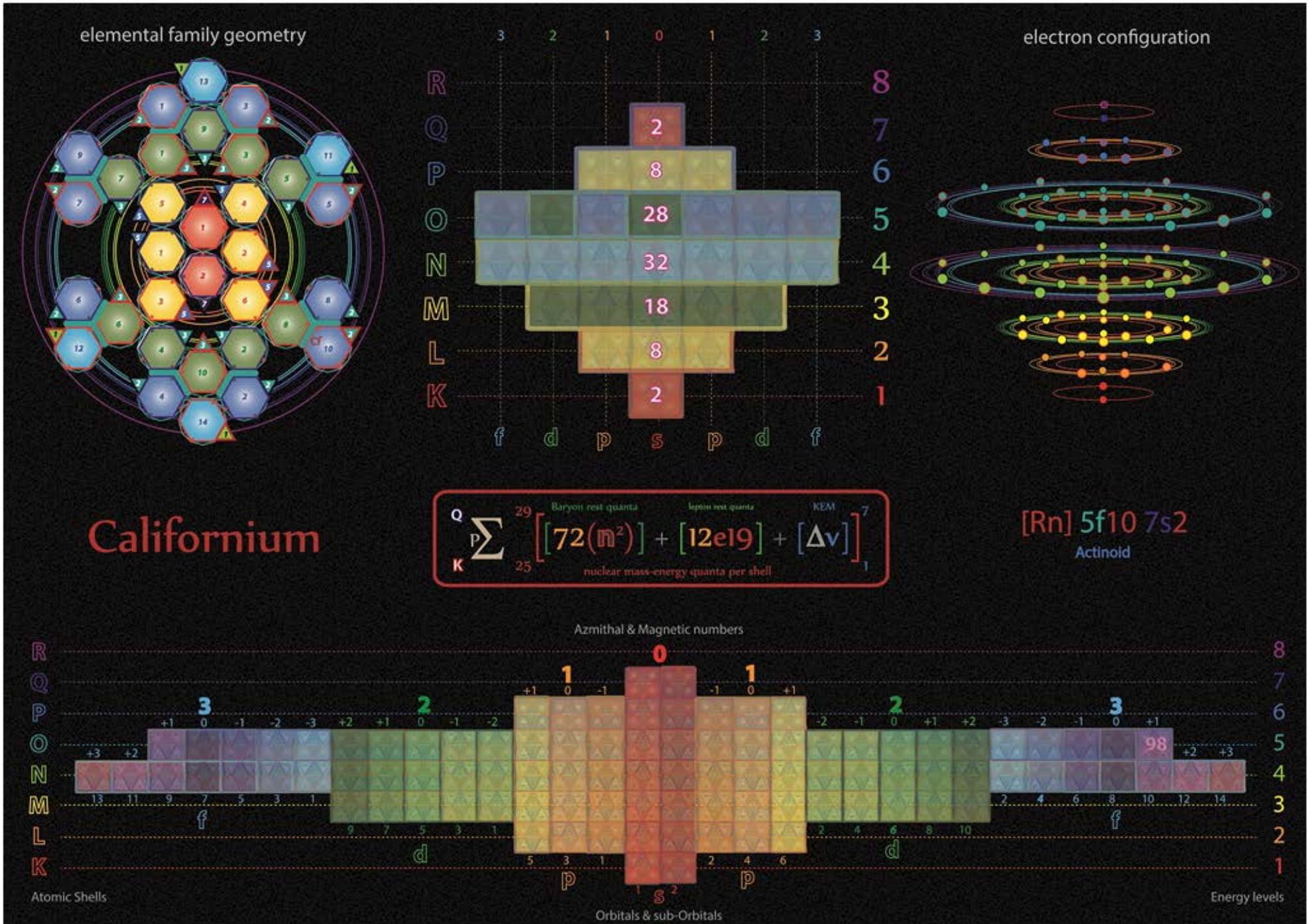
Tetryonics 53.95 - Americium atomic config



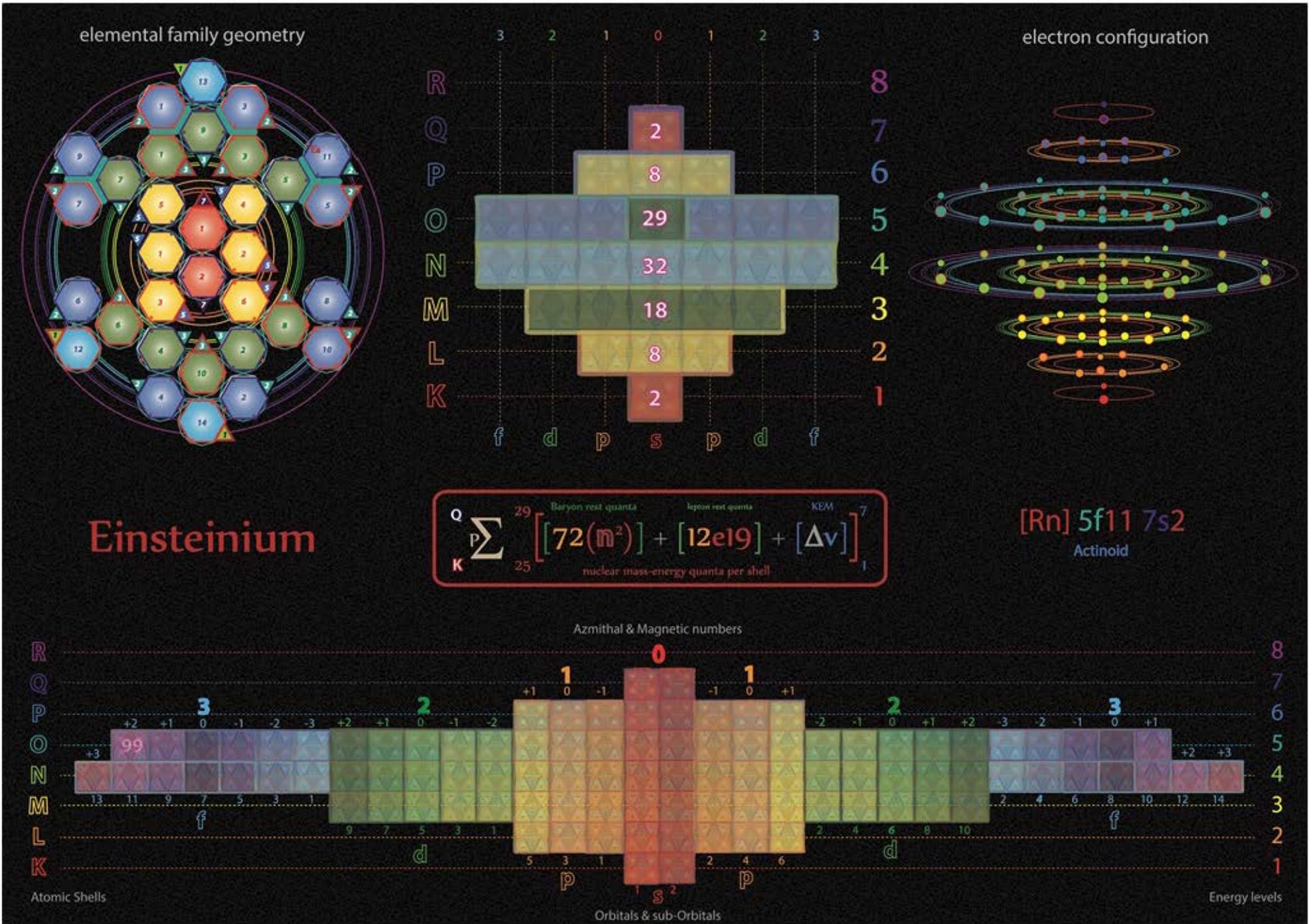
Tetryonics 53.96 - Curium atomic config



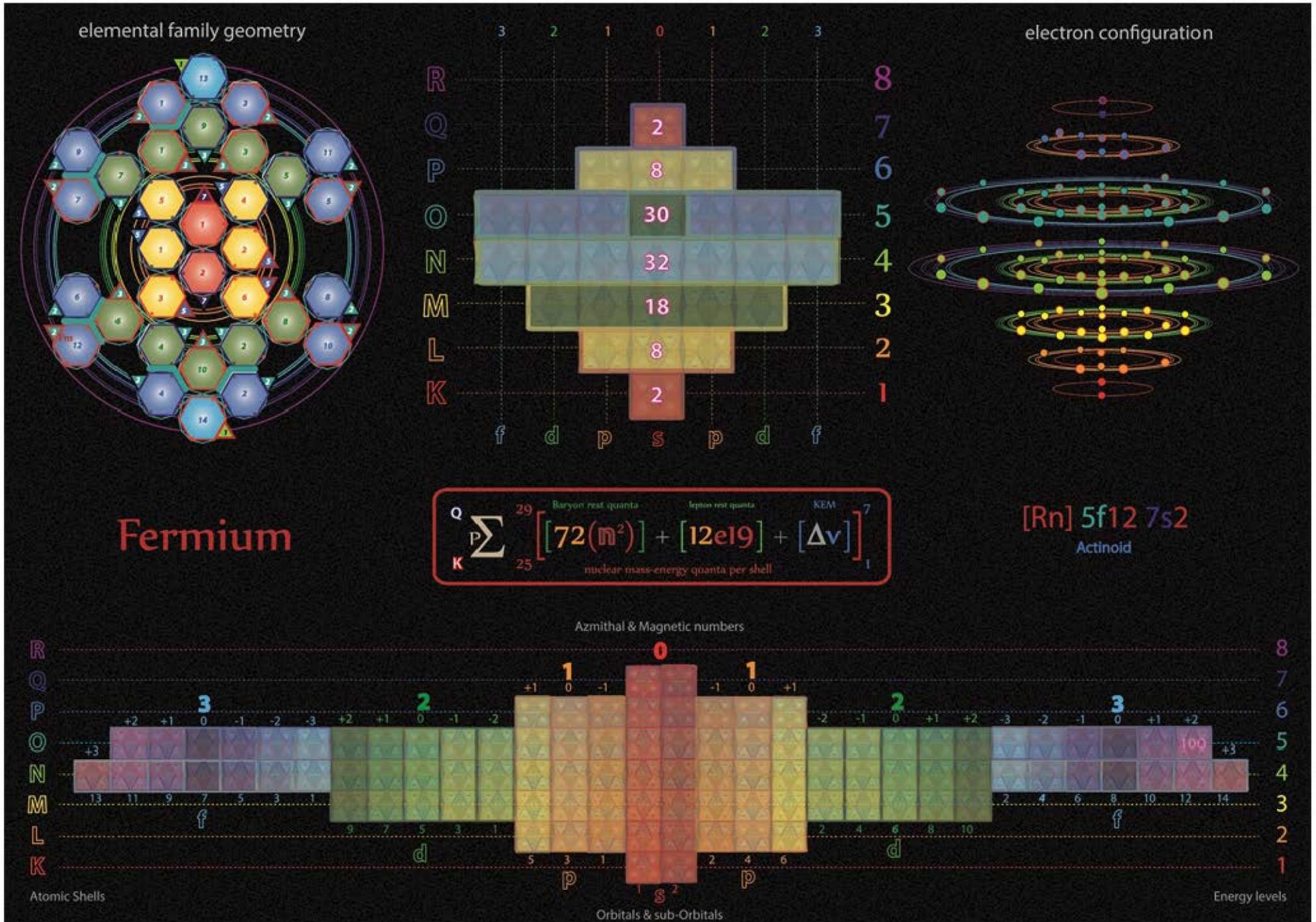
Tetryonics 53.97 - Berkelium atomic config



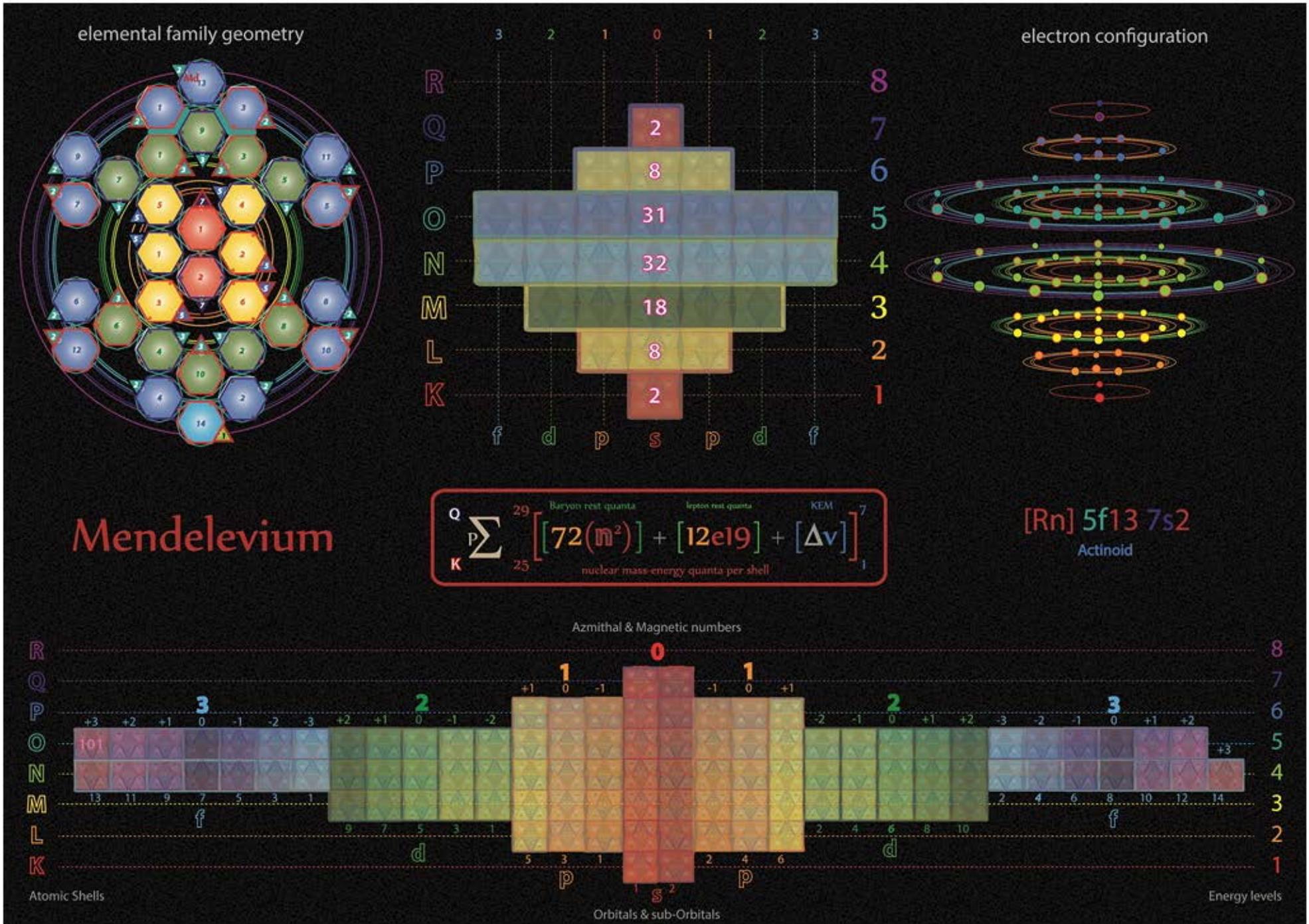
Tetryonics 53.98 - Californium atomic config



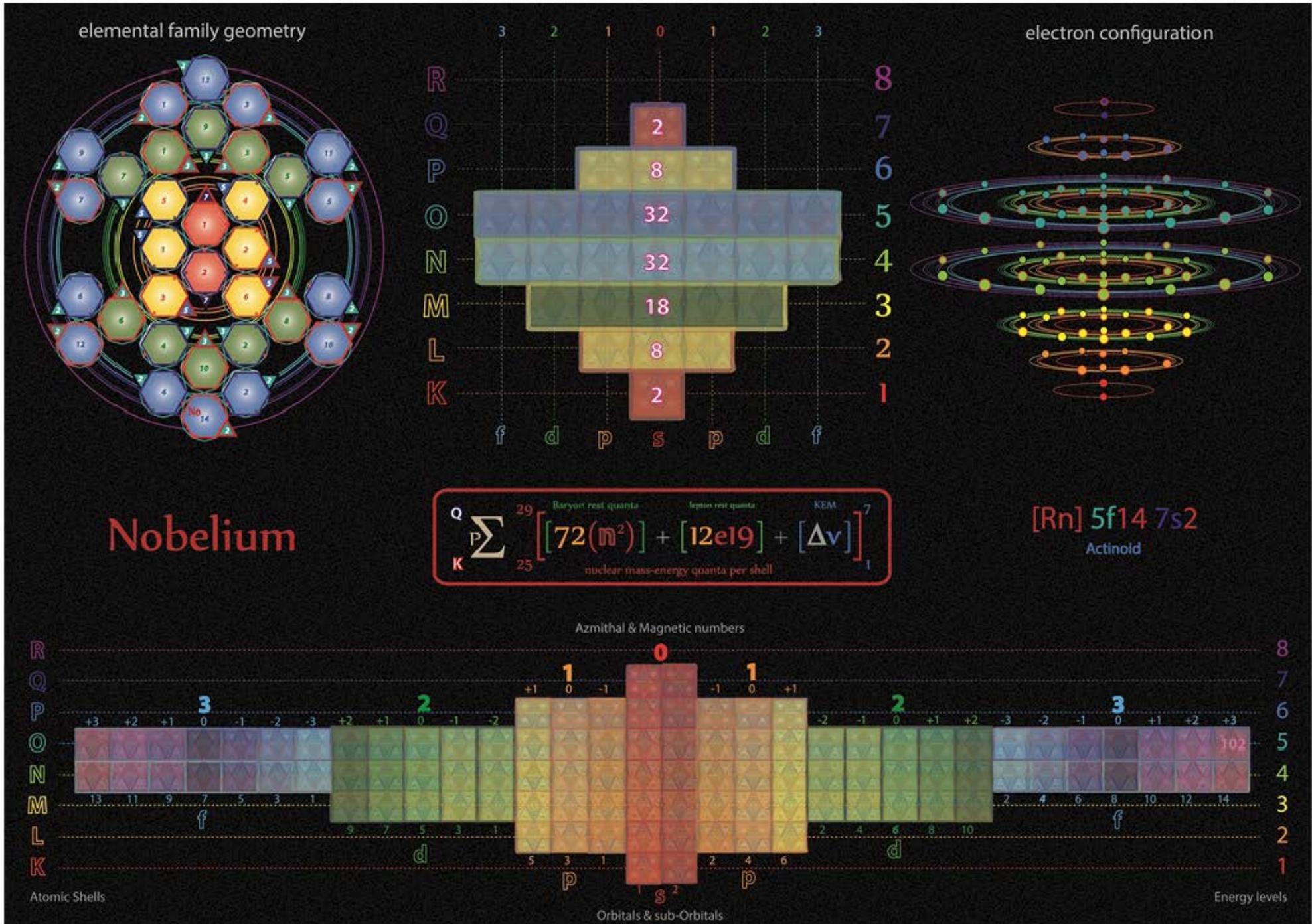
Tetryonics 53.99 - Einsteinium atomic config



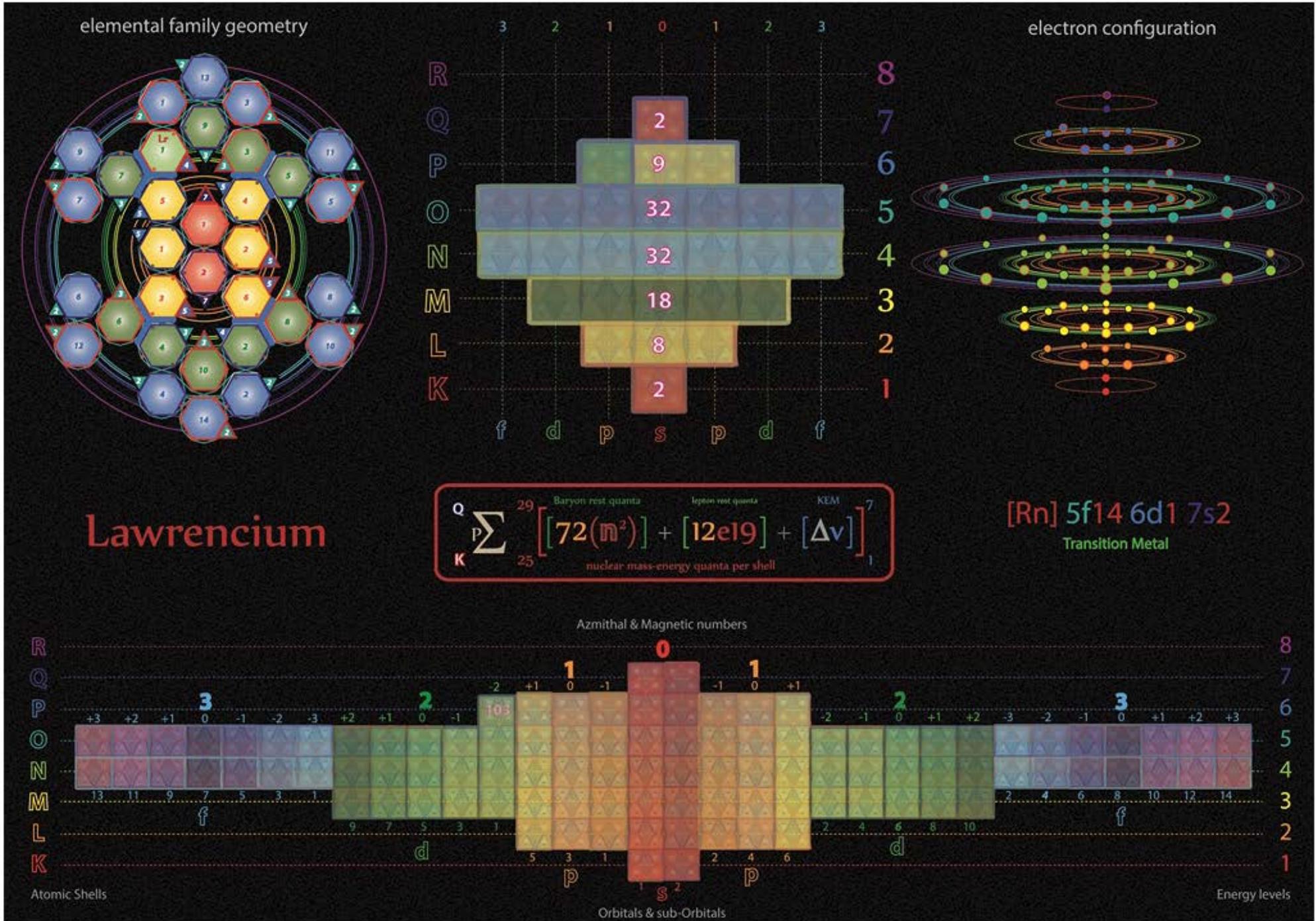
Tetryonics 53.100 - Fermium atomic config



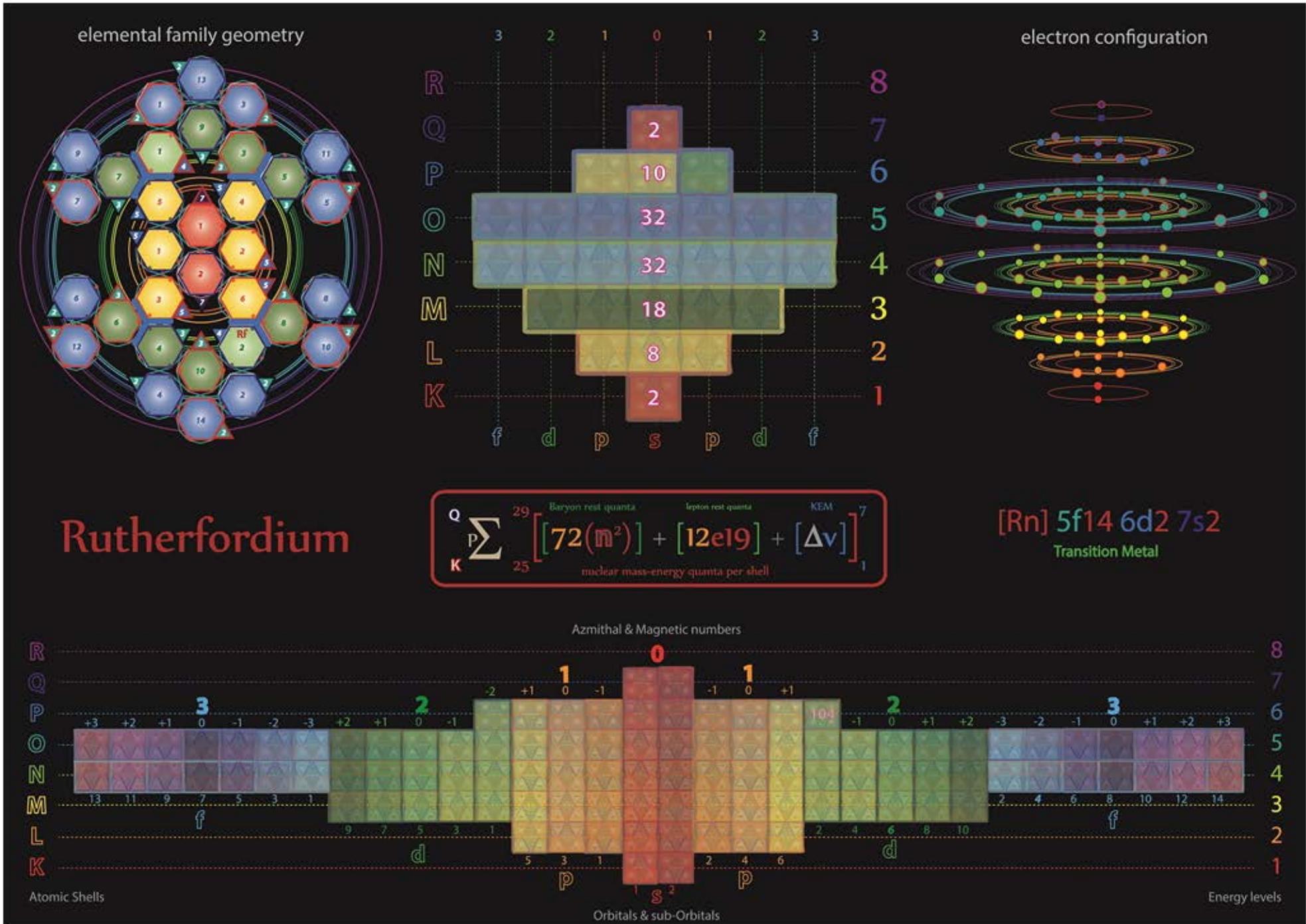
Tetryonics 53.101 - Mendeleevium atomic config



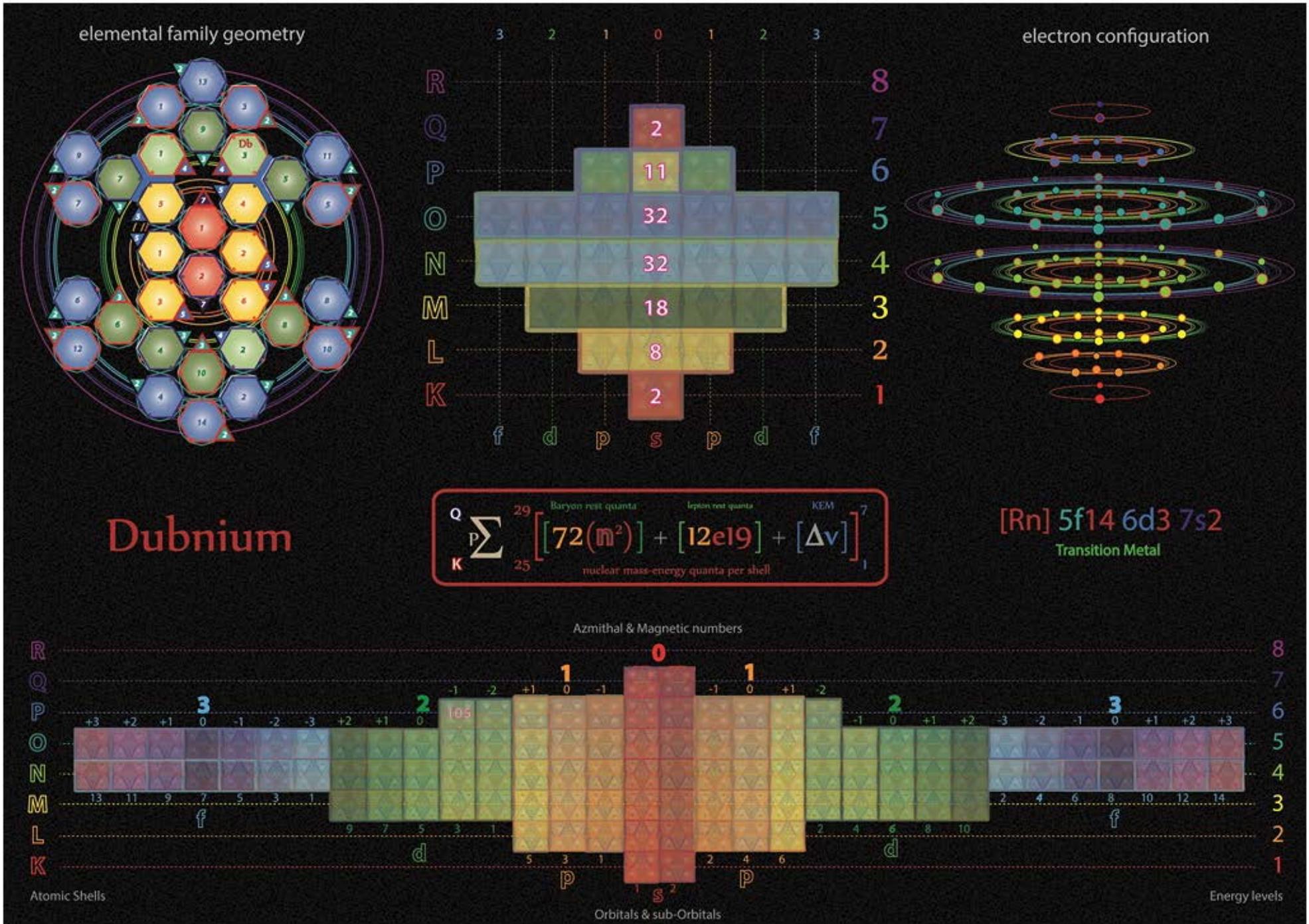
Tetryonics 53.102 - Nobelium atomic config



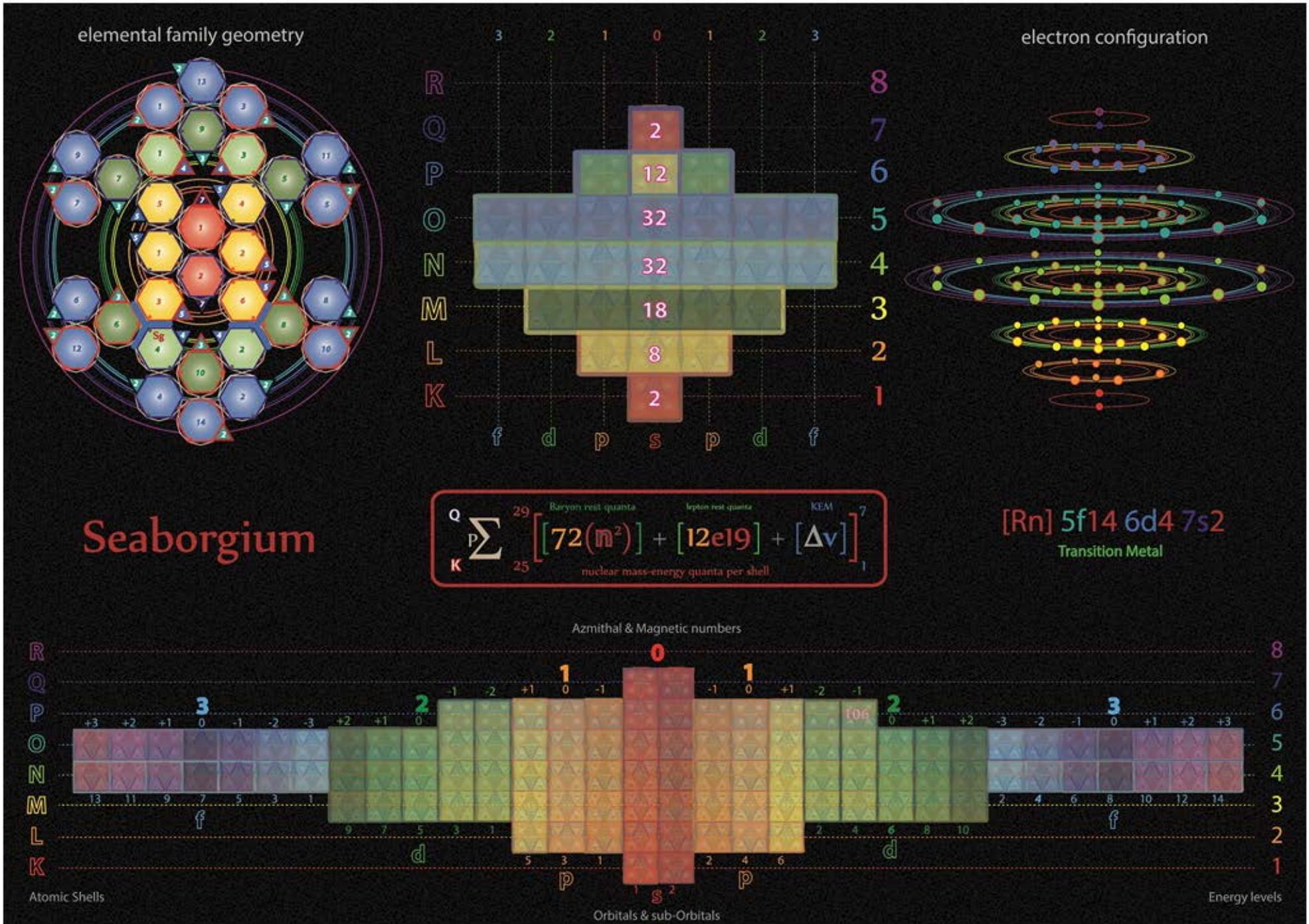
Tetryonics 53.103 - Lawrencium atomic config



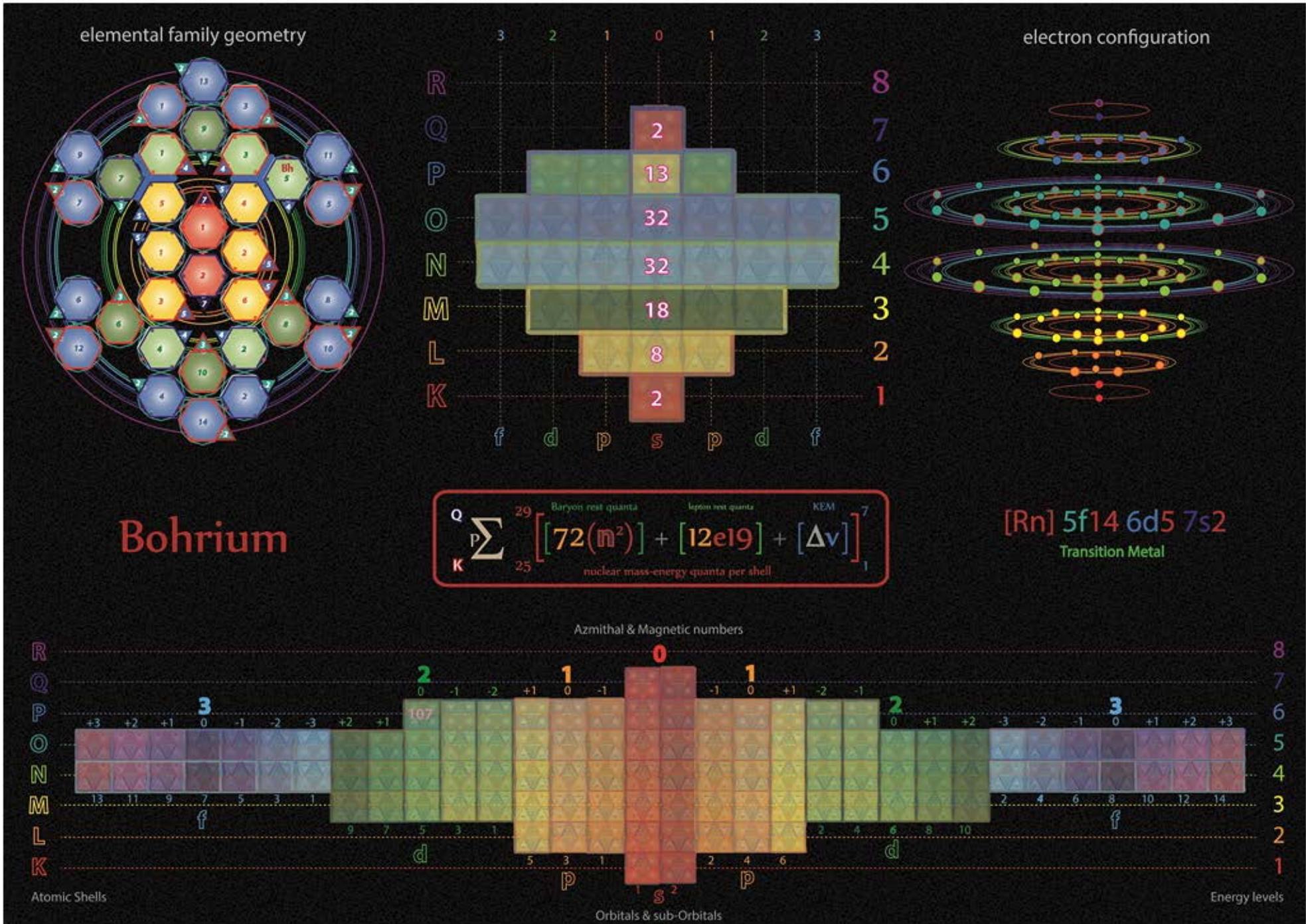
Tetryonics 53.104 - Rutherfordium atomic config



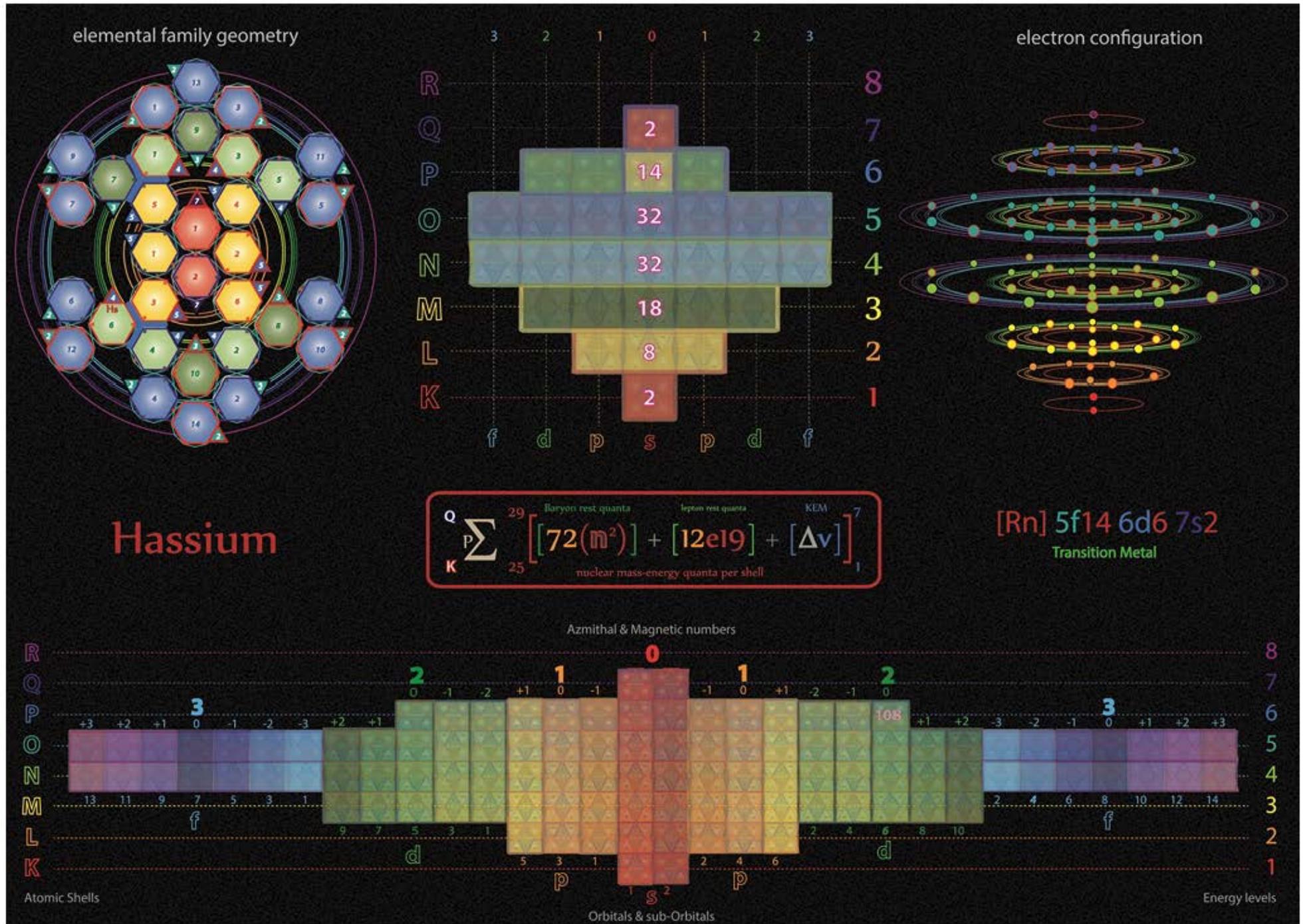
Tetryonics 53.105 - Dubnium atomic config



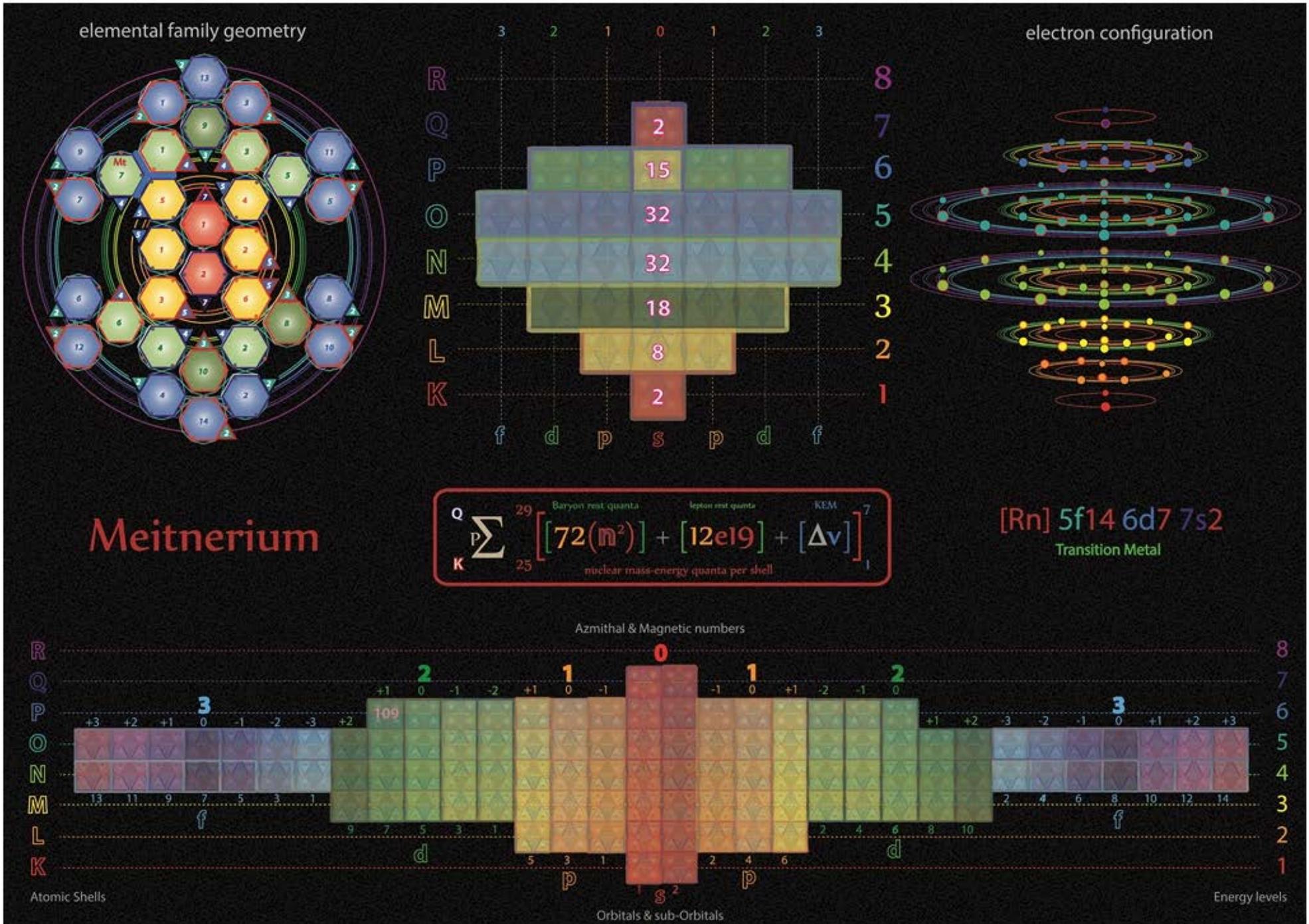
Tetryonics 53.106 - Seaborgium atomic config



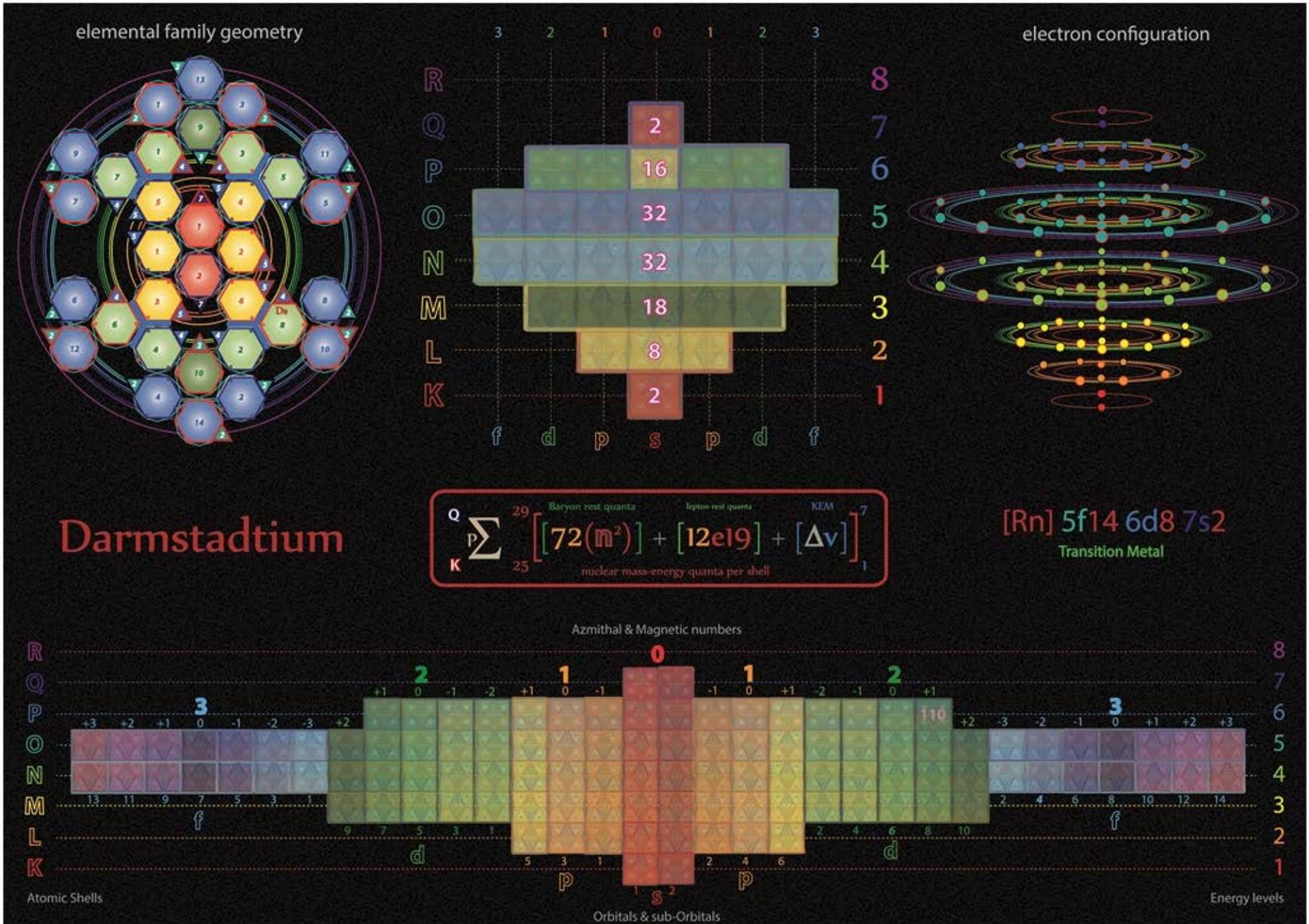
Tetryonics 53.107 - Bohrium atomic config



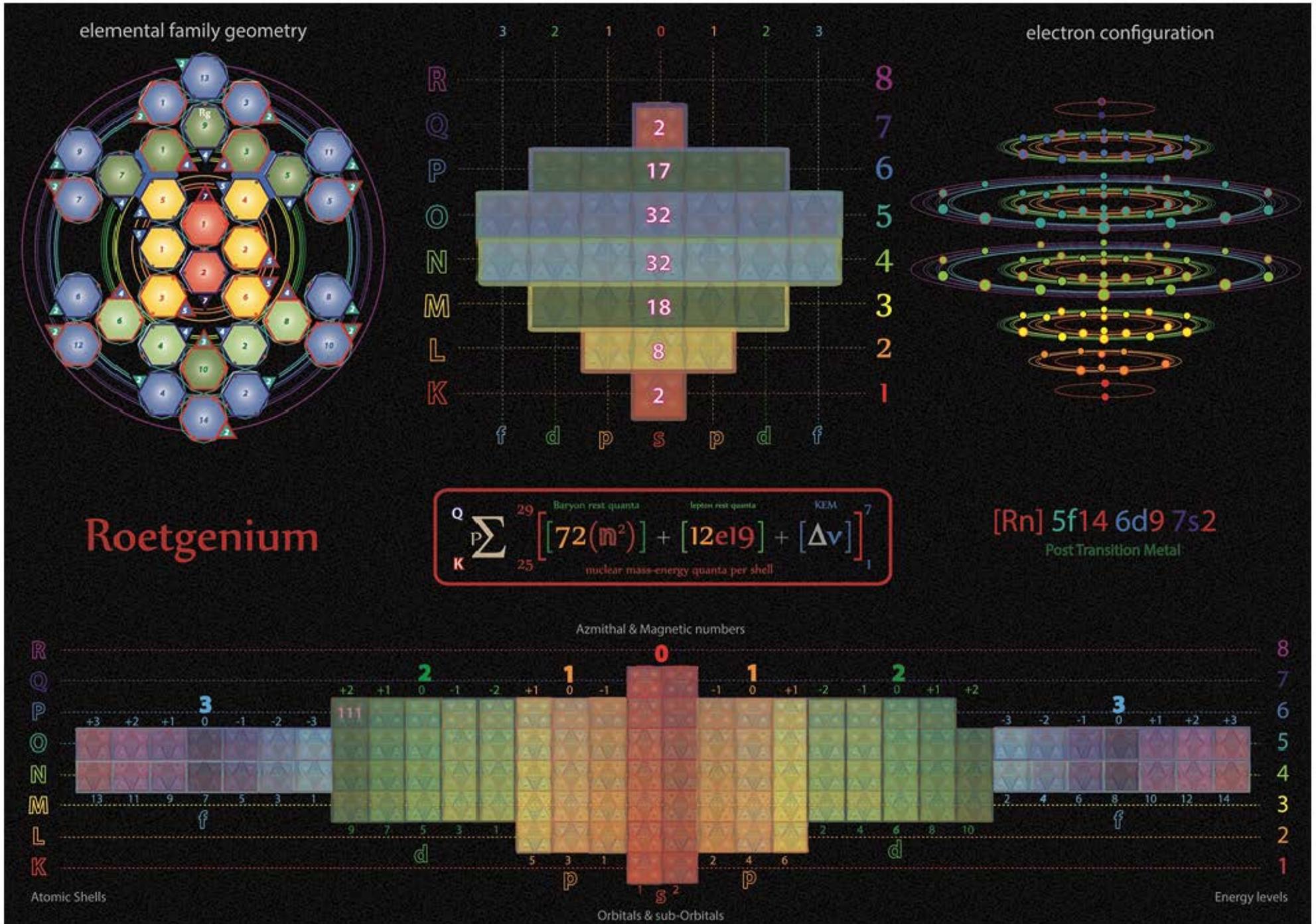
Tetryonics 53.108 - Hassium atomic config



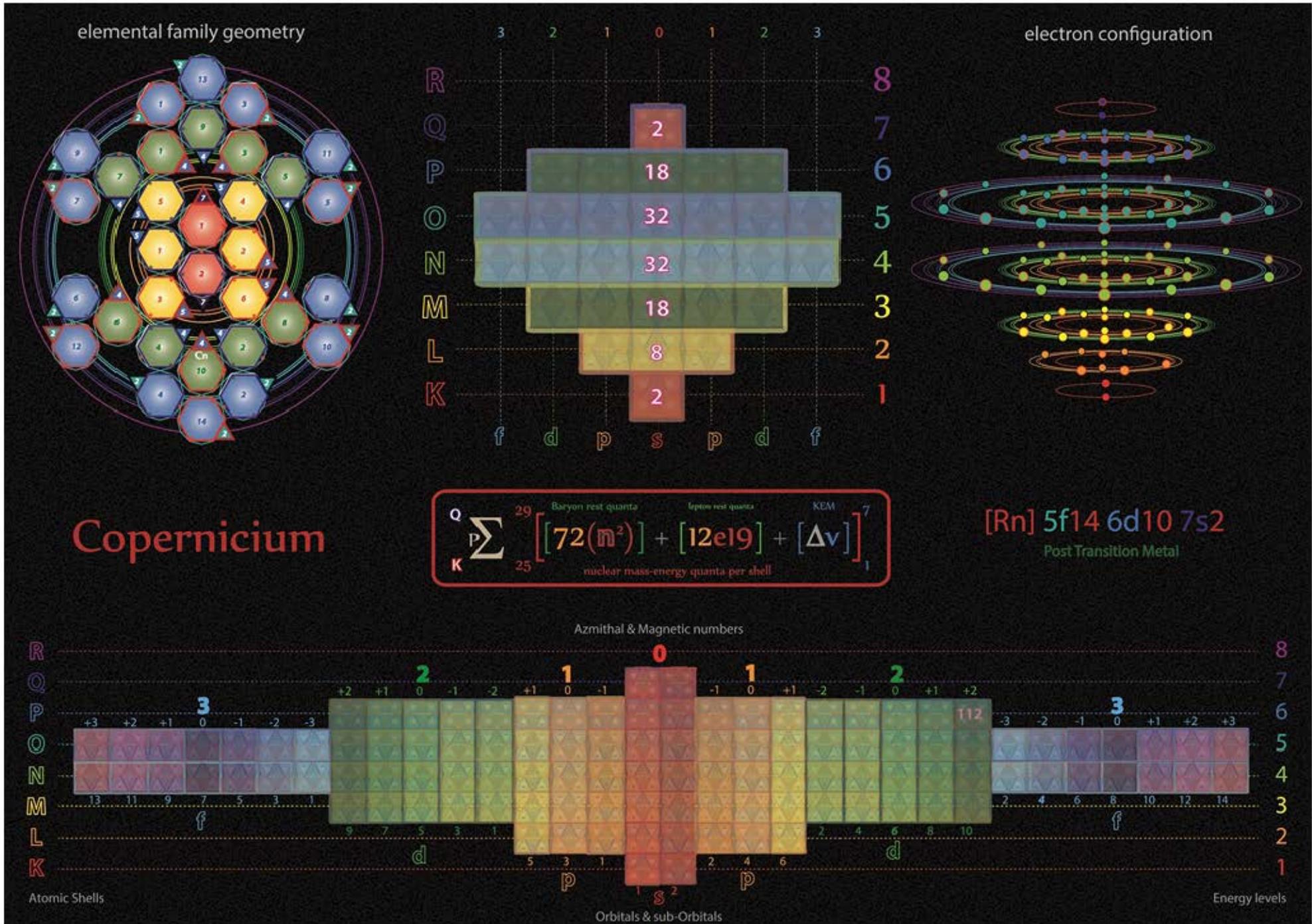
Tetryonics 53.109 - Meitnerium atomic config



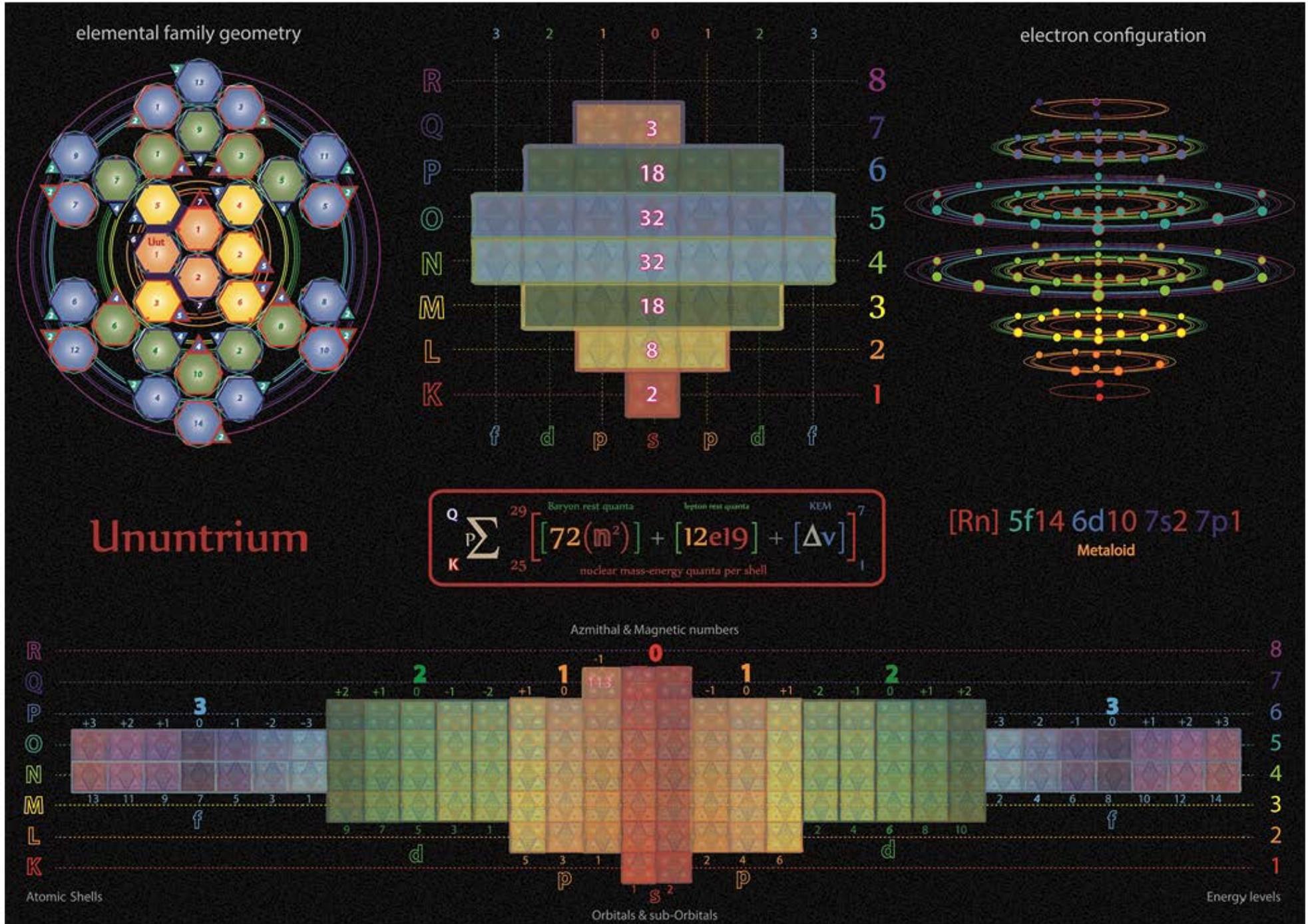
Tetryonics 53.110 - Darmstadtium atomic config



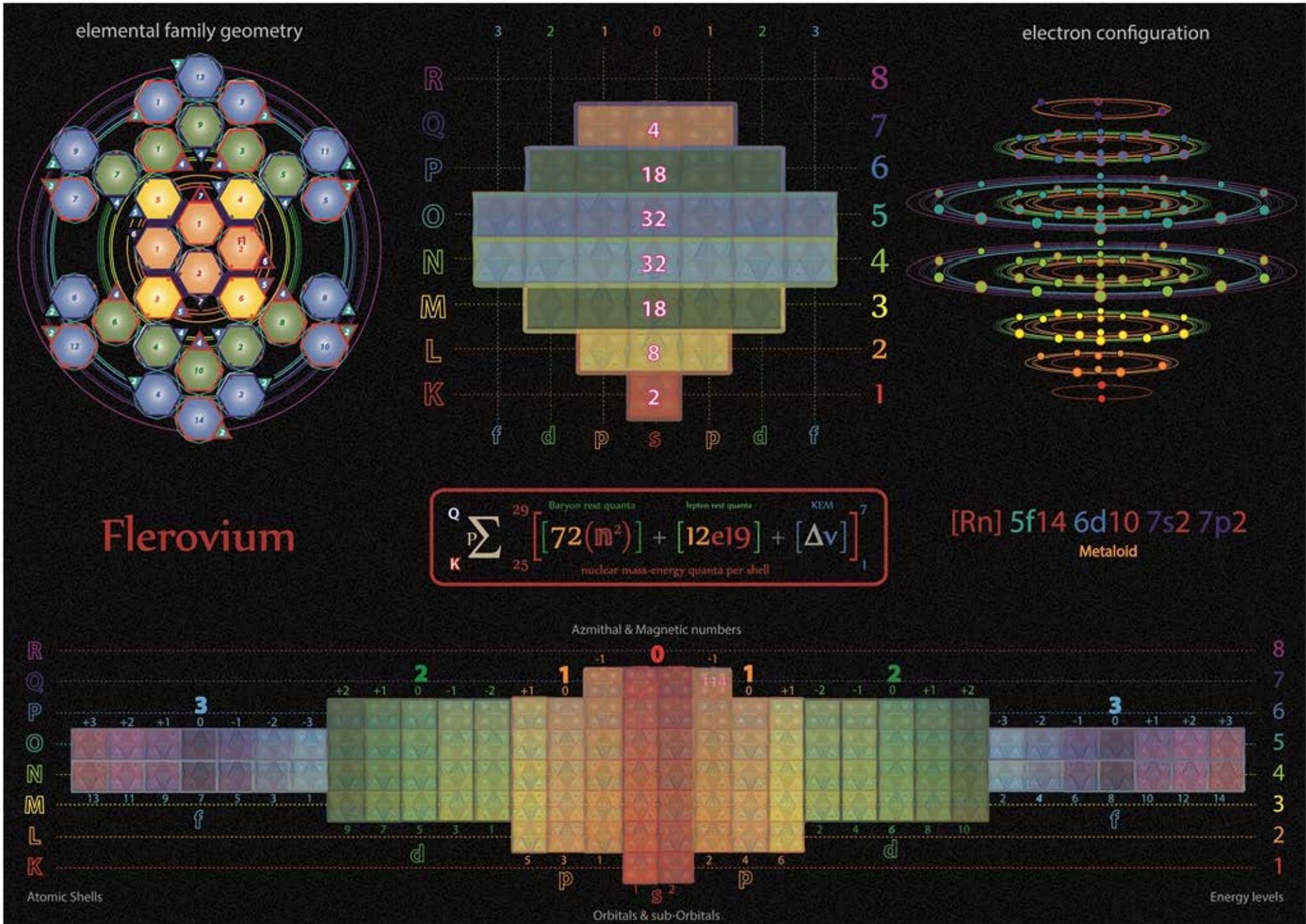
Tetryonics 53.111 - Roetgenium atomic config



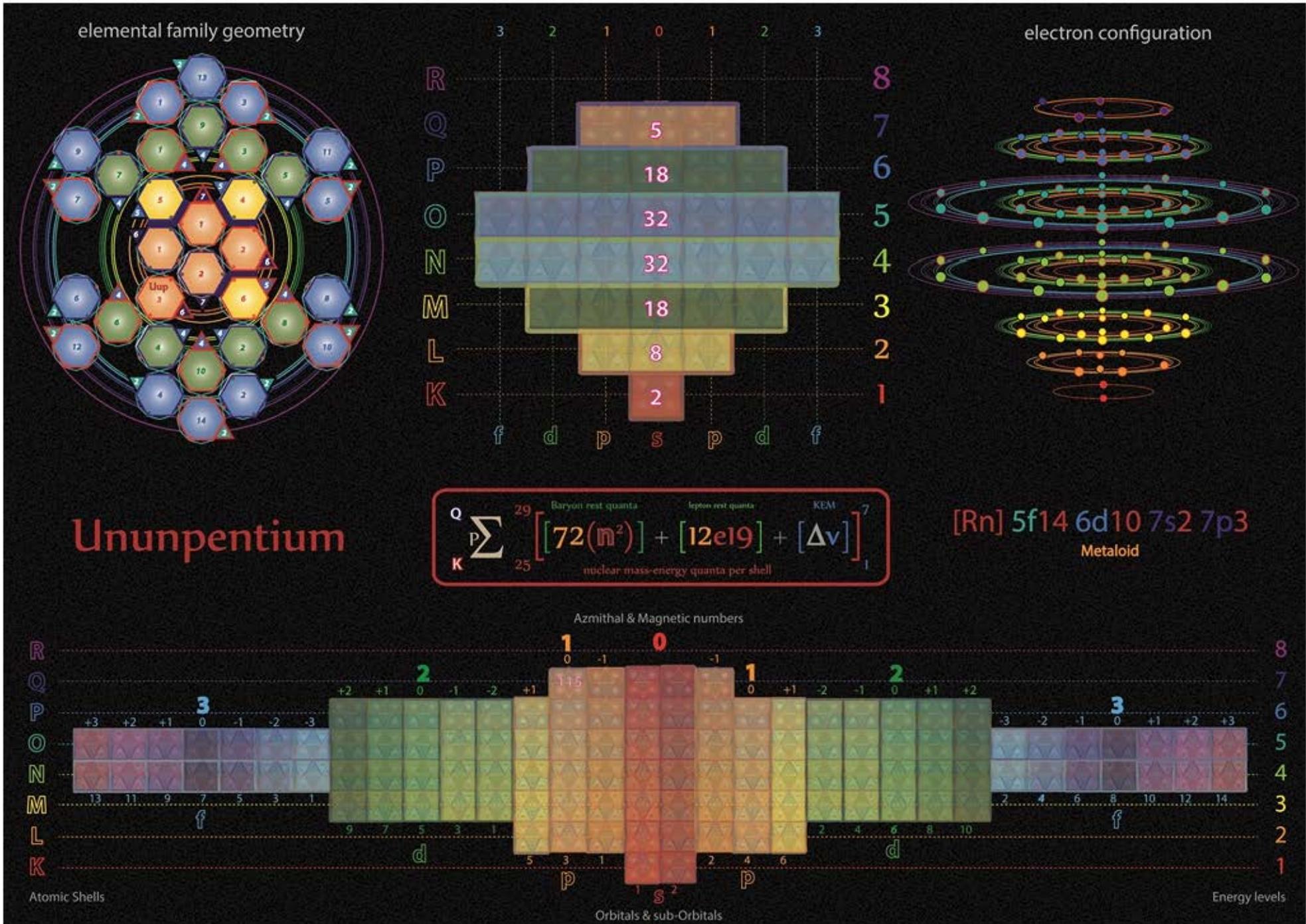
Tetryonics 53.112 - Copernicium atomic config



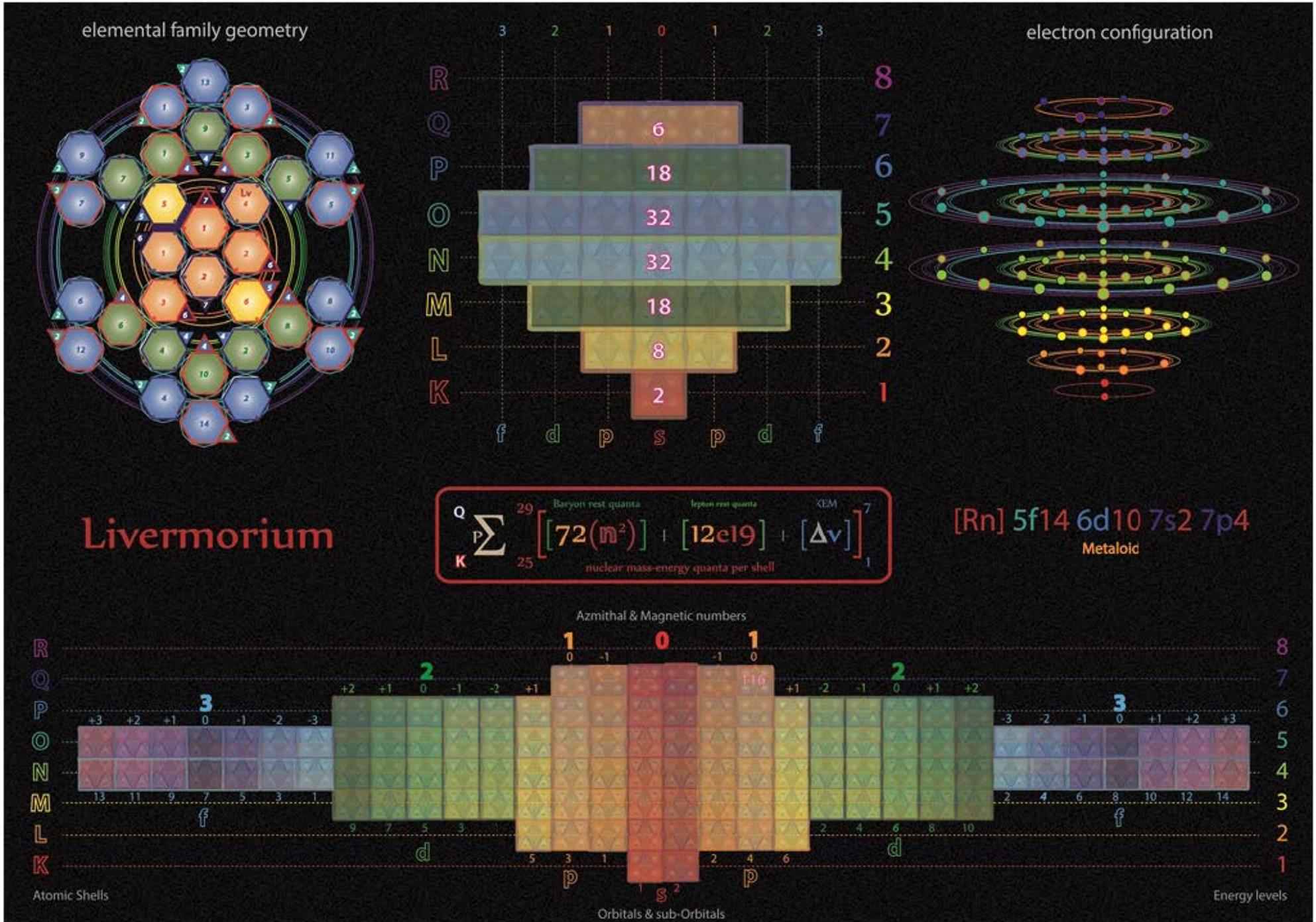
Tetryonics 53.113 - Ununtrium atomic config



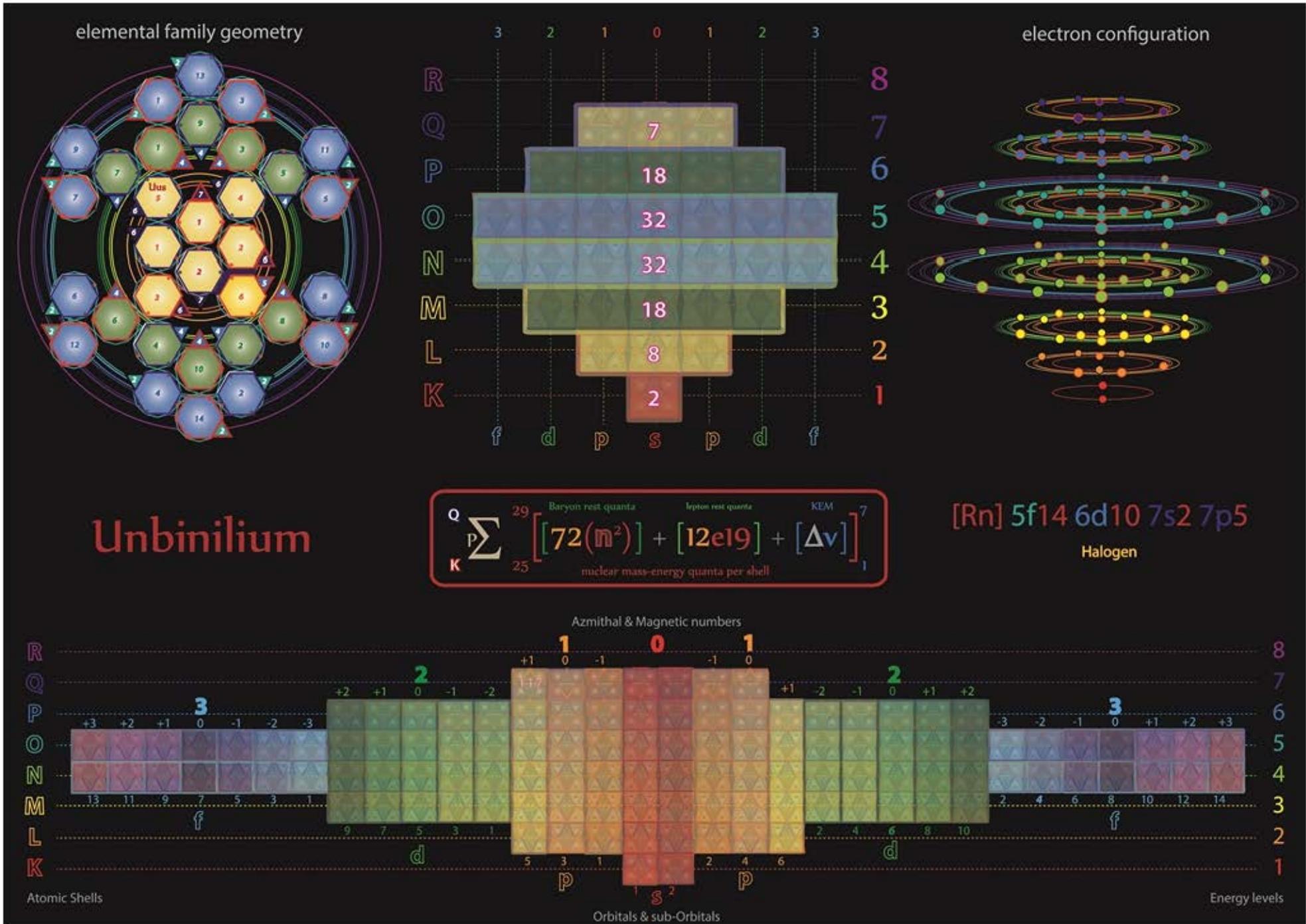
Tetryonics 53.114 - Flerovium atomic config



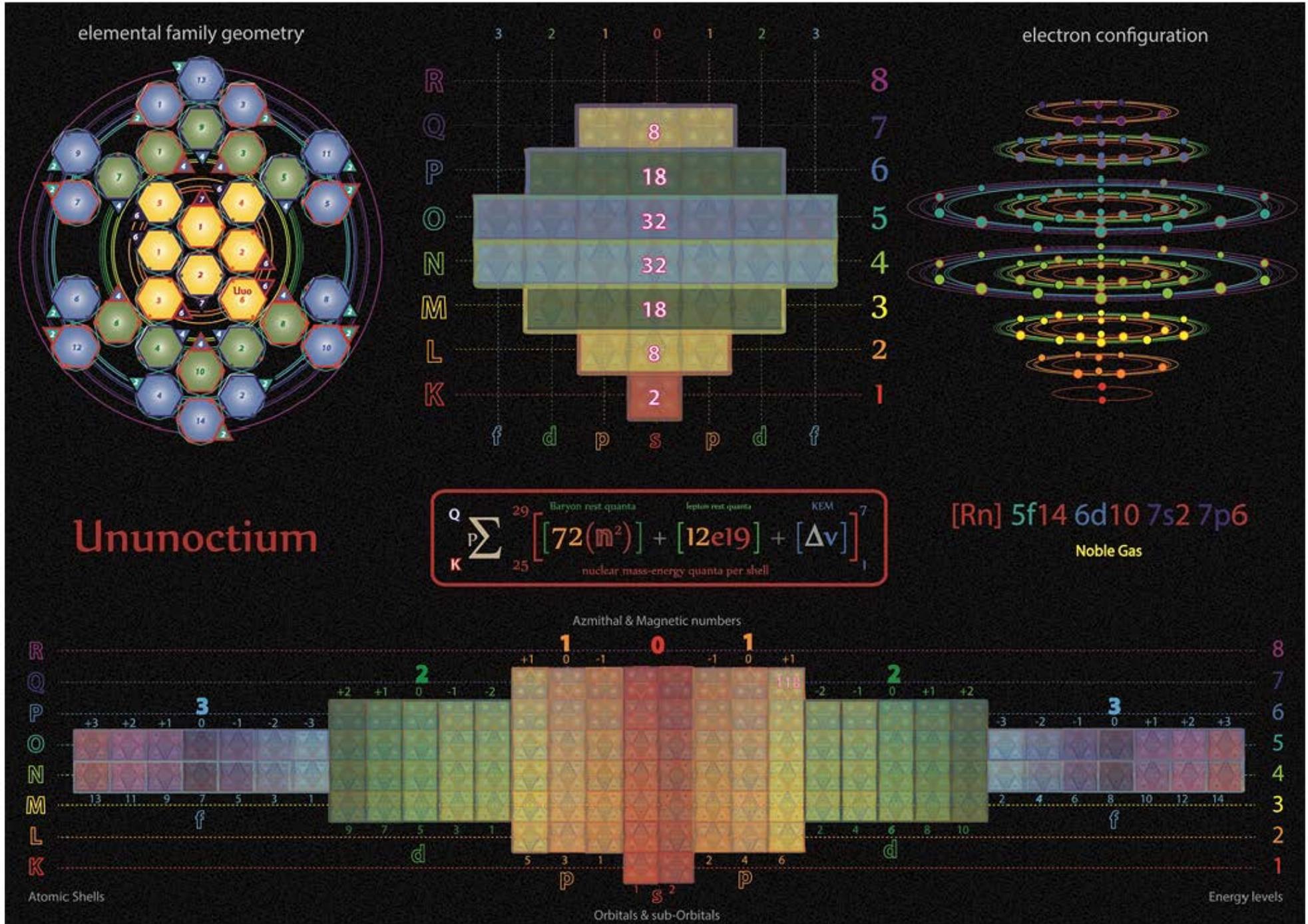
Tetryonics 53.115 - Ununpentium atomic config



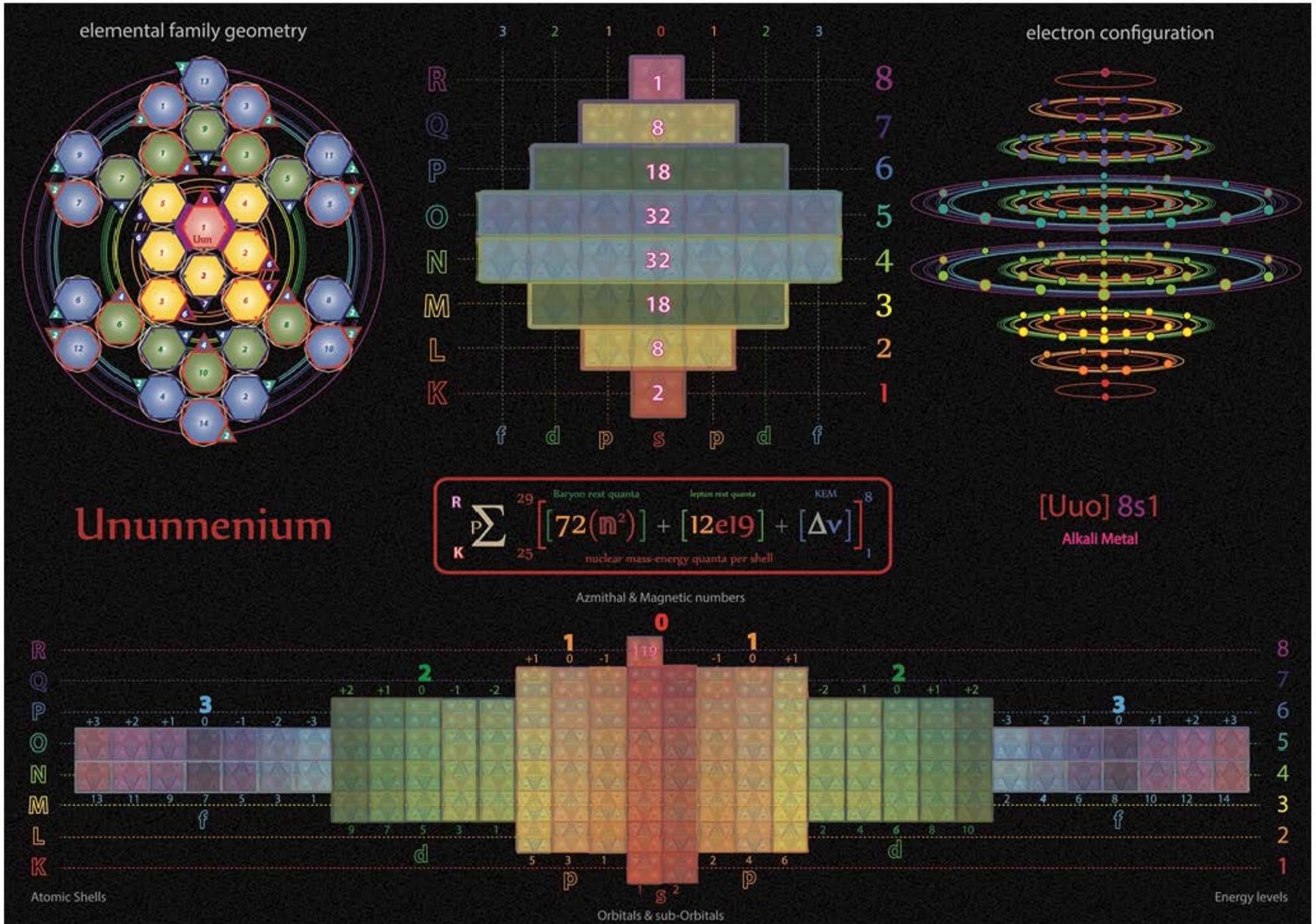
Tetryonics 53.116 - Livermorium atomic config



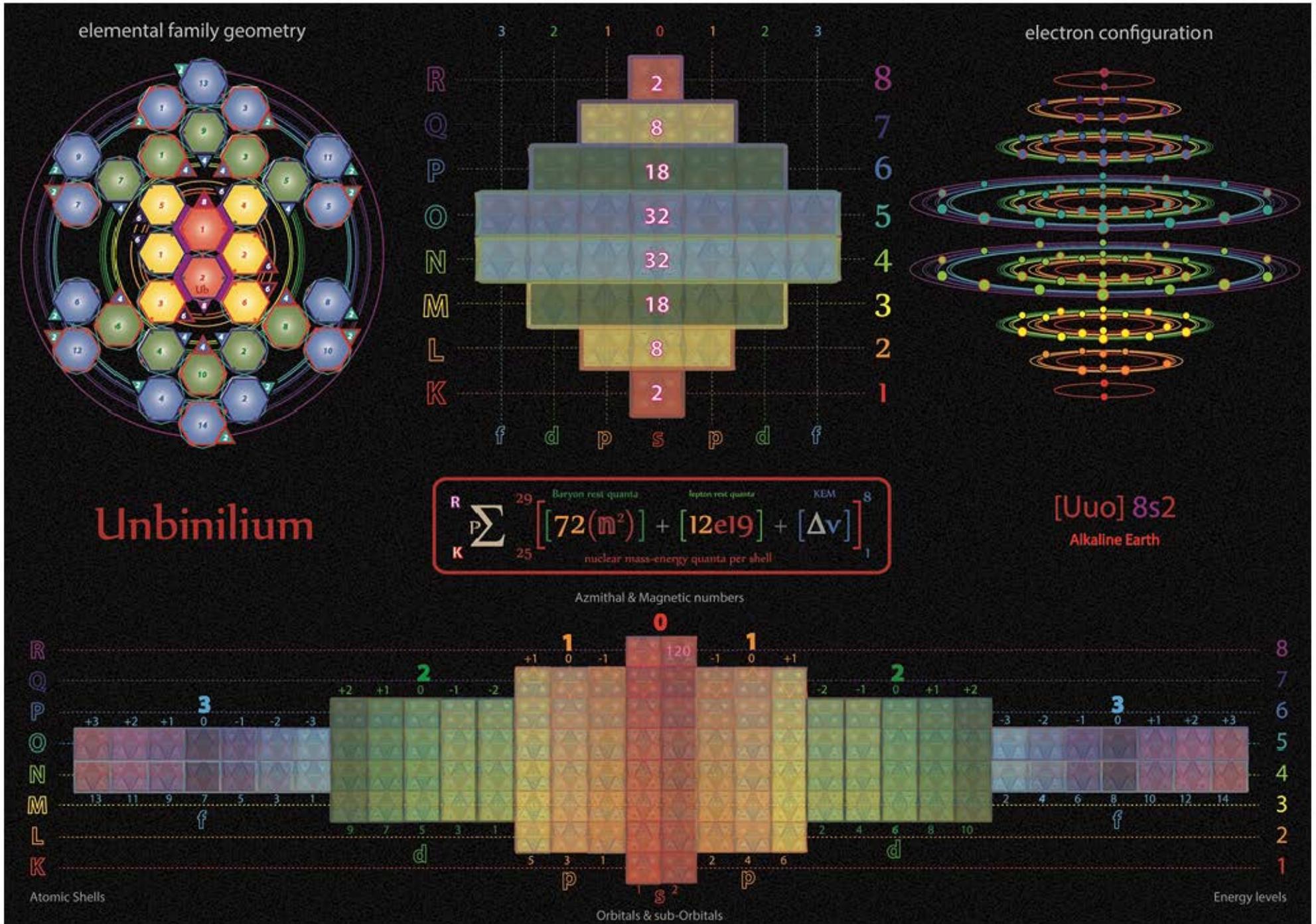
Tetryonics 53.117 - Ununseptium atomic config



Tetryonics 53.118 - Ununoctium atomic config



Tetryonics 53.119 - Ununennium atomic config



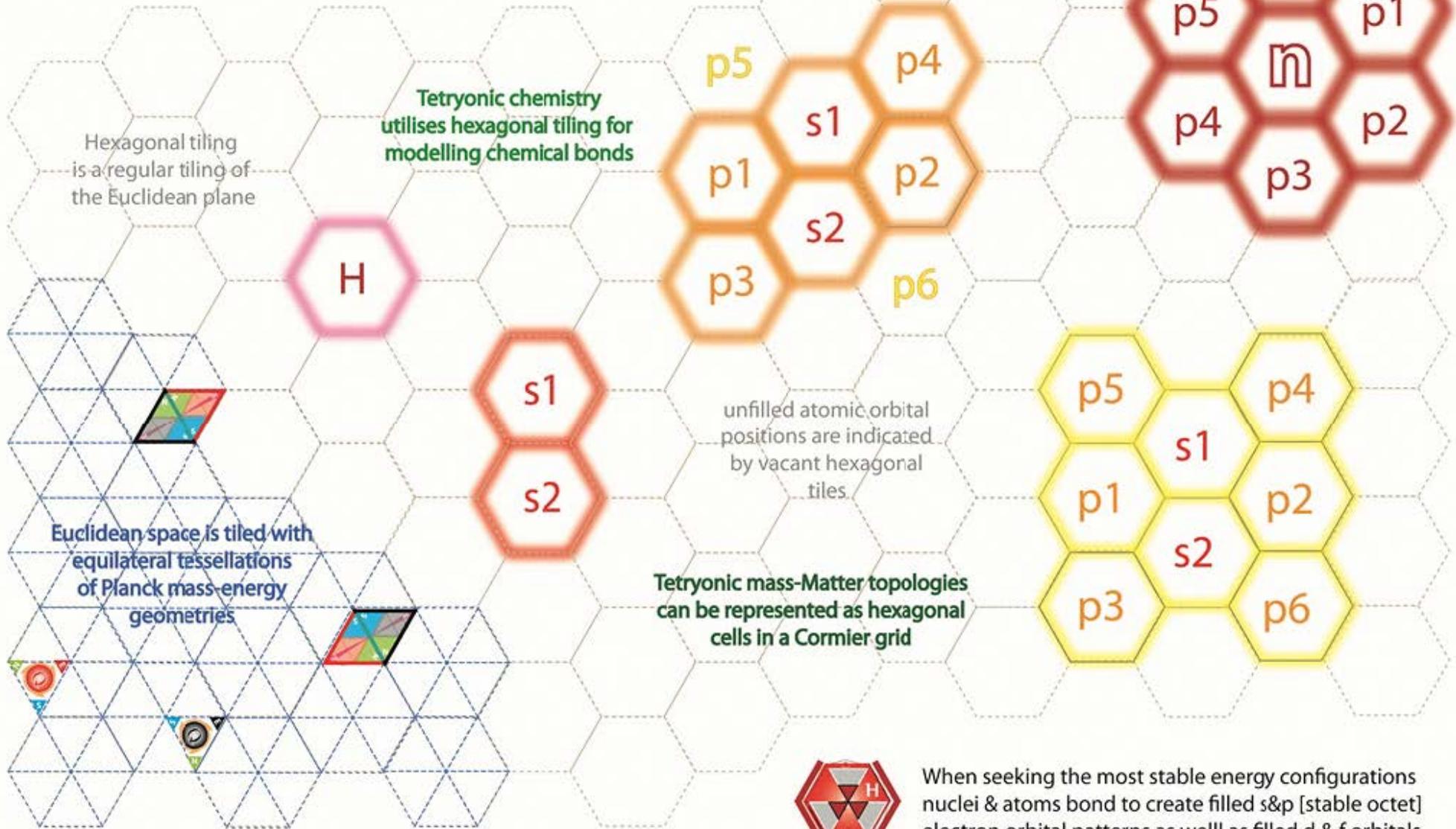
Tetryonics 53.120 - Unbinilium atomic config

Chemical element bonding

All Deuterium nuclei pack in hexagonal patterns to form larger atoms & molecules



Individual chemical element topologies are mapped using Cormier grid...



Periodic Table Atomic configurations

252
[126-126]

Li
6.1615

138,708
[2.023843208 e-26 kg]

3,672
[0.0394GeV]

504
[252-252]

C
12.6493

284,760
[2.88945279 e-26 kg]

14,688
[0.6077GeV]

672
[336-336]

O
16.9744

382,128
[2.8866207 e-26 kg]

36,864
[0.999GeV]

Allotropes are different structural forms of the same element and can exhibit quite different physical properties and chemical behaviours

Lithium

Li
6.1615

252
[126-126]

135,036
[0.9960577602 e-26 kg]

Oxygen

O
15.995

672
[336-336]

360,096
[2.656154027 e-26 kg]

The Periodic Table, although useful in identifying Elements via their atomic and quantum numbers, does not reflect all the charged topologies that Deuterium nuclei can form as they combine.

Allotropes

Various atomic configurations with the same Tetryonic charge, but differing in their final mass-Matter topologies and properties can be formed - they are the Allotropes

Some of the more plentiful chemical elements form this way

Carbon

504
[254-254]

C₁₂
11.9968

270,072
[1.99705421 e-26 kg]

6 [Protons [24-12]
Neutrons [18-18]
electrons [0-12]] $\infty 1$

504
[252-252]

C
11.9968

270,072
[1.99705421 e-26 kg]

6 [Protons [24-12]
Neutrons [18-18]
electrons [0-12]] $\infty 1$

504
[252-252]

C
12.6493

284,760
[2.88945279 e-26 kg]

14,688
[0.6077GeV]

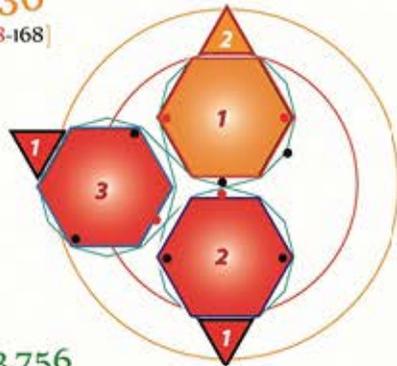
6 [Protons [24-12]
Neutrons [18-18]
electrons [0-12]] $\infty 1-2$

Allotropes are elements created from the same number of Deuterium nuclei as periodic elements but possess a differing mass-Matter topology

Q

same component charge

336
[168-168]



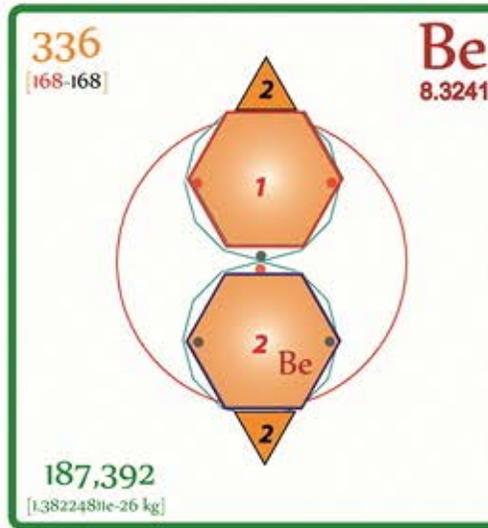
183,756

different Matter geometries

M

The varying material geometries allows what is the same chemical element to possess vastly different bonding points and chemical attributes

Beryllium
8



336
[168-168]

Be
8.3241

187,392
[1.3822481e-26 kg]

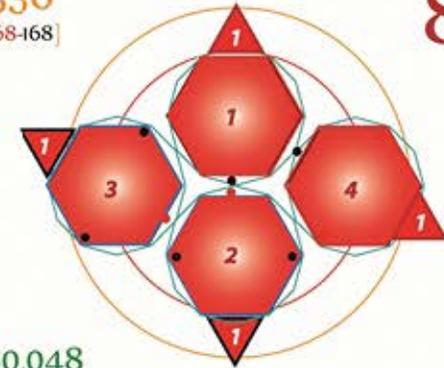
Allotropic geometries [charge vs Matter]

	3	2	1	0	1	2	3	
R								8
Q								7
P								6
O								5
N								4
M								3
L								2
K								1
	f	d	p	s	p	d	f	

Some element allotropes have different Matter topologies that persist in different phases

336
[168-168]

Beryllium
8



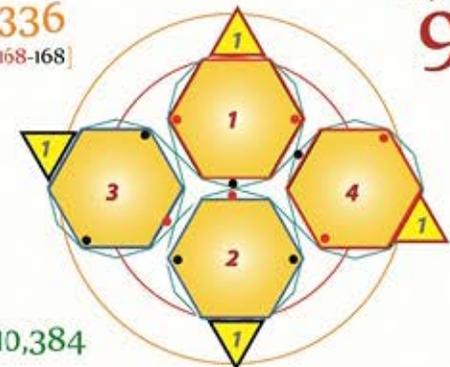
180,048

Allotropes vs. Isotopes

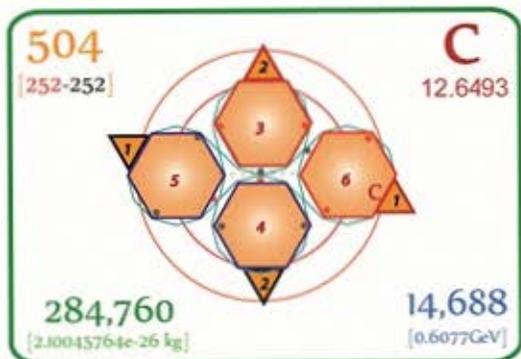
Isotopes are elementary atoms with the same number of nuclei, but with differing energy levels, resulting in different mass-energies

336
[168-168]

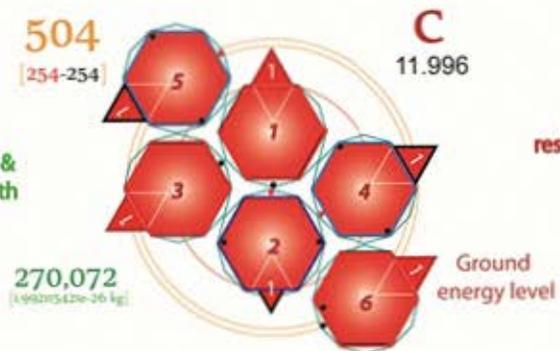
Beryllium
9



210,384



Tetryonic theory affords us the ability to model the charged mass-energy geometries & 3D Matter topologies of each element along with its bonding points



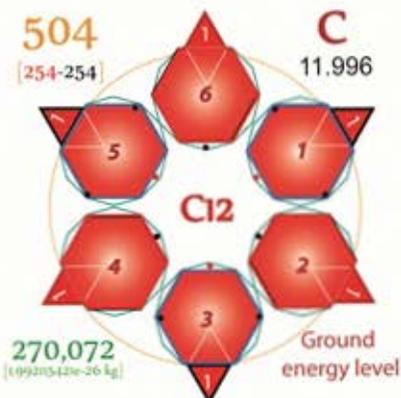
It also allows for the calculation of the molar rest mass-energy geometry of any Matter topology

Carbon Allotropes

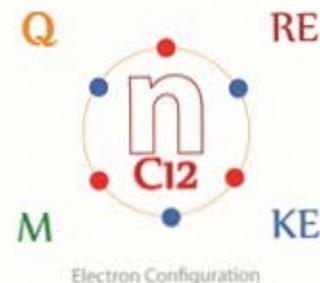
Carbon is capable of forming many allotropes due to its valency.

Well known forms of carbon include:

- Carbon
- Diamond
- Graphite
- Graphene
- Amorphous carbon
- Buckminsterfullerenes
- Carbon nanotubes
- Glassy carbon
- atomic & diatomic carbon



Graphene has a unique p orbital arrangement of its electrons

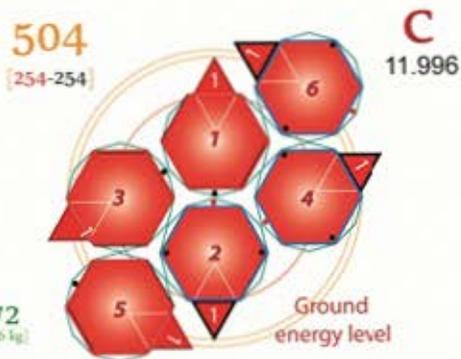


Electron Configuration

Shell	[n] p6	Molar meM	Nuclei per shell
R 8	446,976	19.855	6
Q 7	418,680	18.598	6
P 6	391,392	17.385	6
O 5	365,112	16.218	6
N 4	339,840	15.095	6
M 3	315,576	14.018	6
L 2	292,320	12.985	6
K 1	270,072	11.996	6

Carbon-14, a radioactive isotope of carbon with a half-life of 5,730 years, is used to find the age of formerly living things through a process known as radiocarbon dating.

In 1961 the international unions of physicists and chemists agreed to use the mass of the isotope carbon-12 as the basis for atomic weight.



There are nearly ten million known carbon compounds and an entire branch of chemistry, known as organic chemistry, is devoted to their study.

Graphene

504
(254-254)

C
11.996

mp6

270,072
(0.0000426-0.0000426 kg)

Ground energy level

Graphene is also an allotrope of carbon.

Its structure is one-atom-thick planar sheets of sp²-bonded carbon atoms that are densely packed in a honeycomb crystal lattice

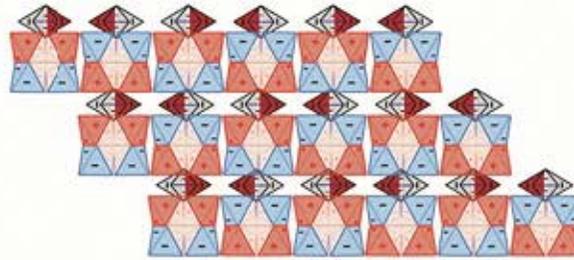
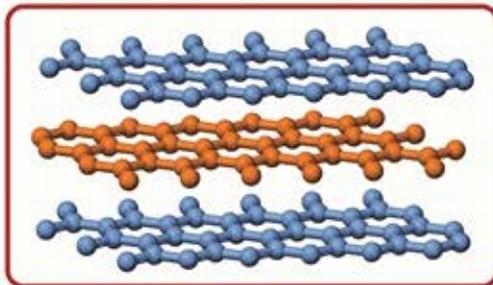
Graphite

The mineral graphite is an allotrope of carbon.

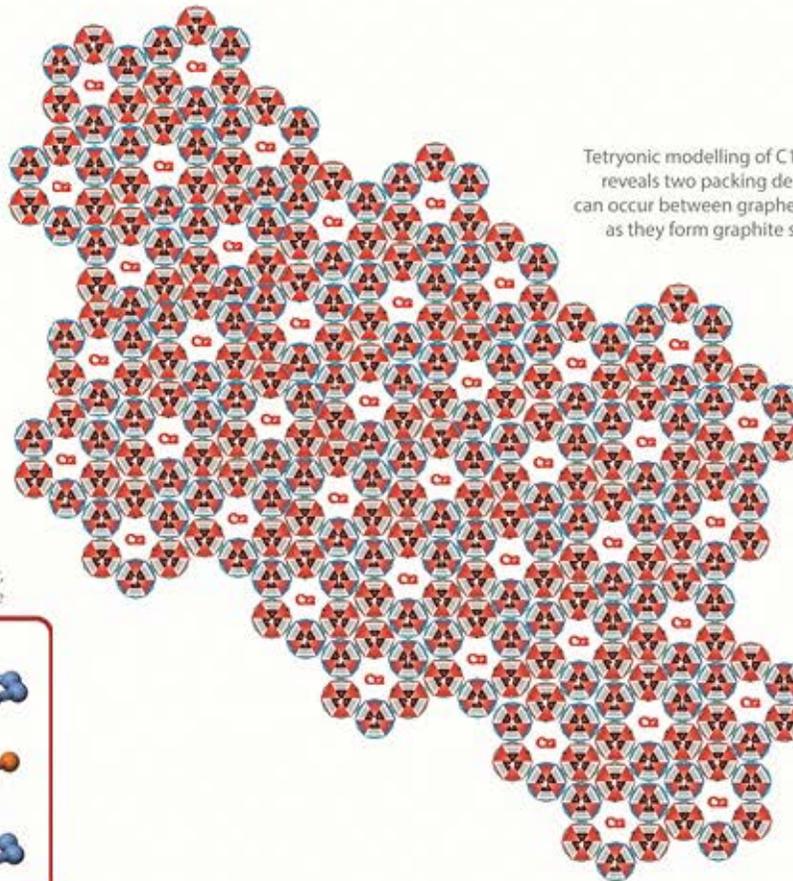
Unlike periodic table carbon [diamond], graphite is an electrical conductor, a semi-metal.

And Graphite is the most stable form of carbon under standard conditions.

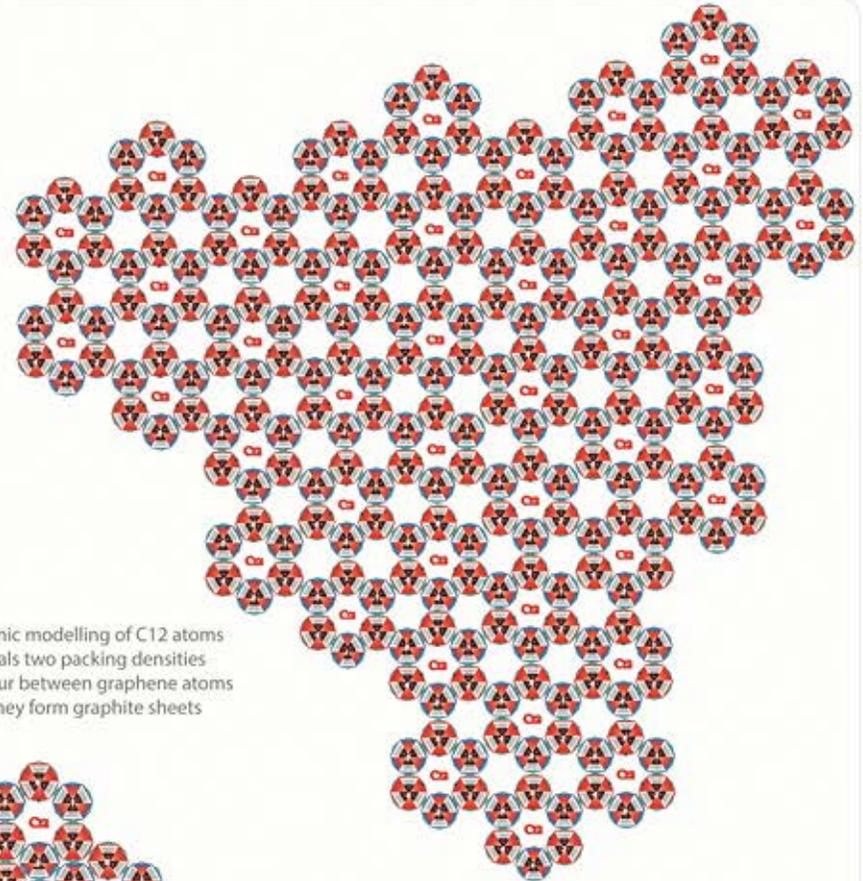
Graphite has a layered, planar structure. In each layer, the carbon atoms are arranged in a hexagonal lattice



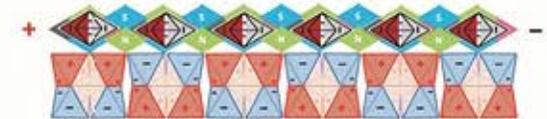
Graphite electrons can act as atomic bearings between the planar sheets of graphene



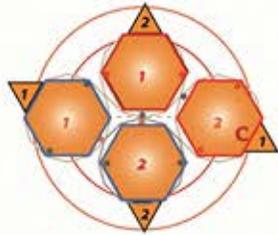
Tetronic modelling of C12 atoms reveals two packing densities can occur between graphene atoms as they form graphite sheets



Unlike periodic carbon where electrons are tightly bound, graphite is highly conductive, with electrical energy being propagated via the electrons & their KEM fields

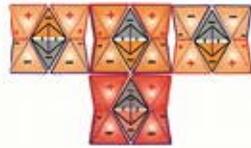


Graphene electrons are loosely bound to the top of the Deuterium nuclei



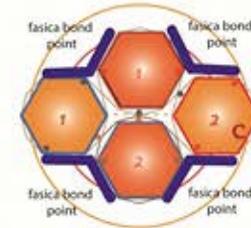
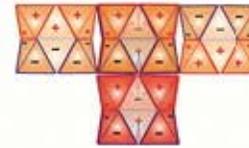
Periodic [C6] Carbon

Diamonds are renowned as a material with superlative physical qualities, most of which originate from the strong fascia bonds between its atoms.



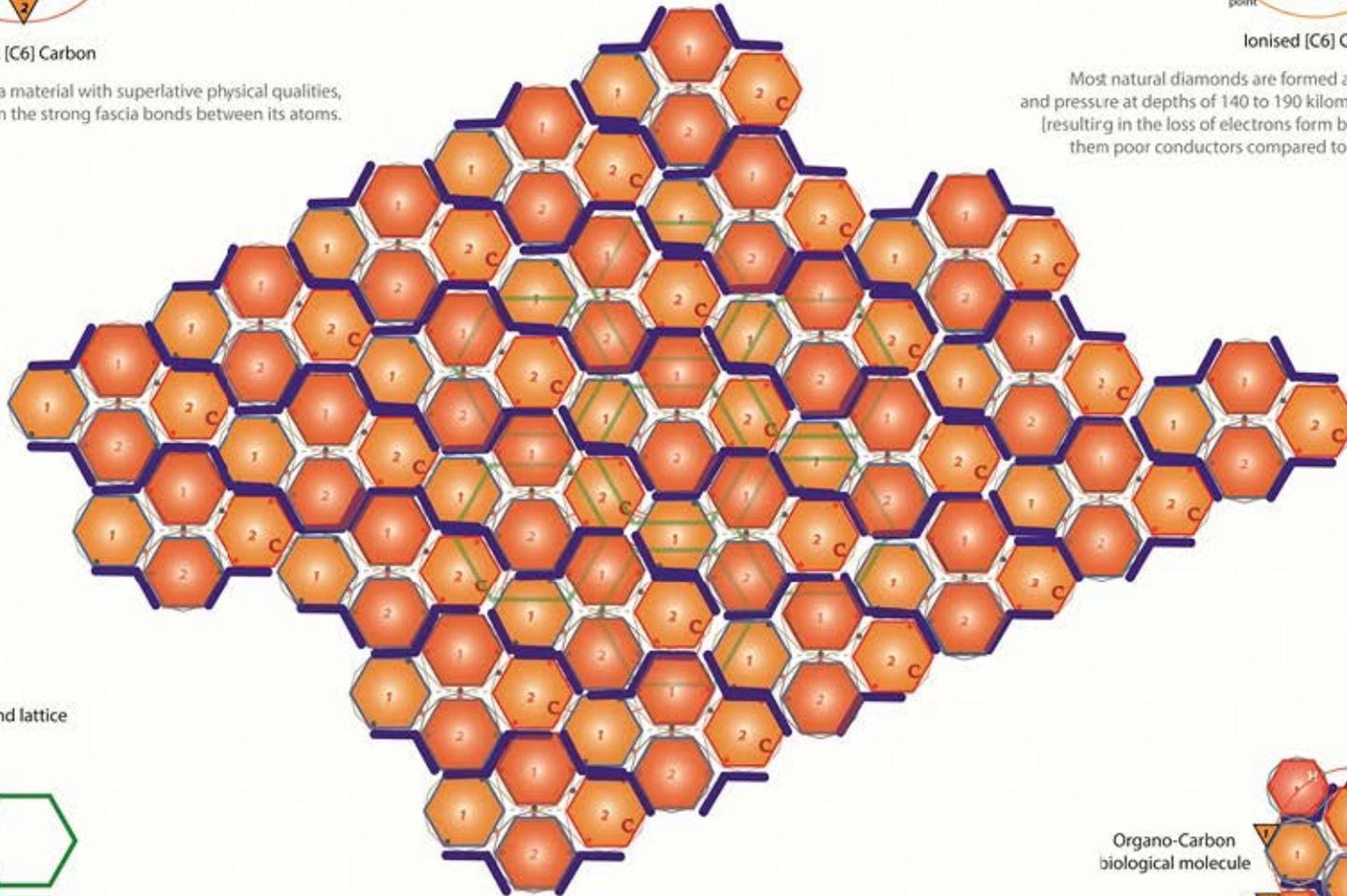
Diamonds

are a metastable allotrope of carbon, where the carbon atoms are arranged in cubic crystal structure called a diamond lattice.

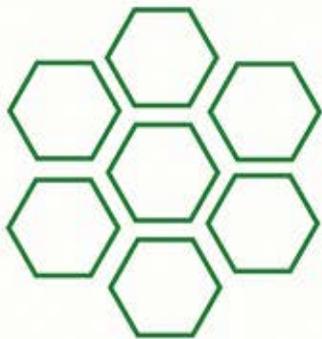


Ionised [C6] Carbon

Most natural diamonds are formed at high temperature and pressure at depths of 140 to 190 kilometers in the Earth's mantle [resulting in the loss of electrons from bound positions, making them poor conductors compared to graphene atoms].



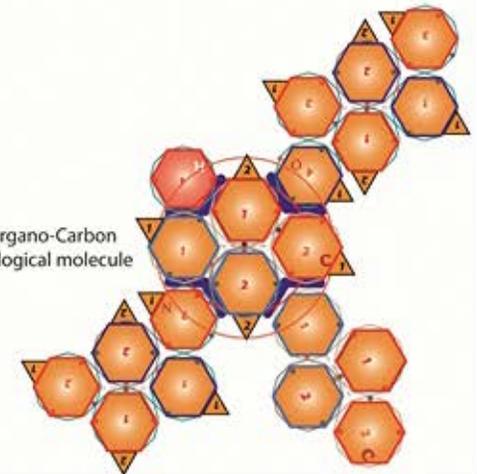
filled n[C7] Carbon diamond lattice



The chemical bonds that hold the carbon atoms in diamonds together are stronger than those in graphite.

In diamonds, the bonds form an inflexible three-dimensional lattice, whereas in graphite, the atoms are tightly bonded into sheets, which can slide easily over one another, making the overall structure weaker

Organo-Carbon biological molecule

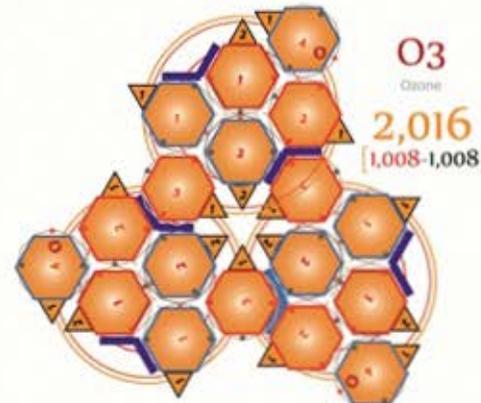
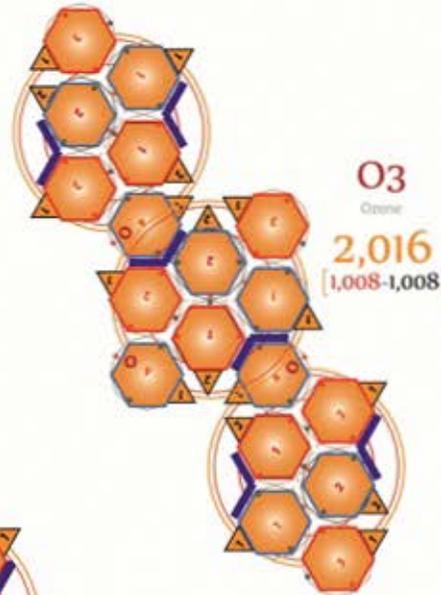


Oxygen Allotropes

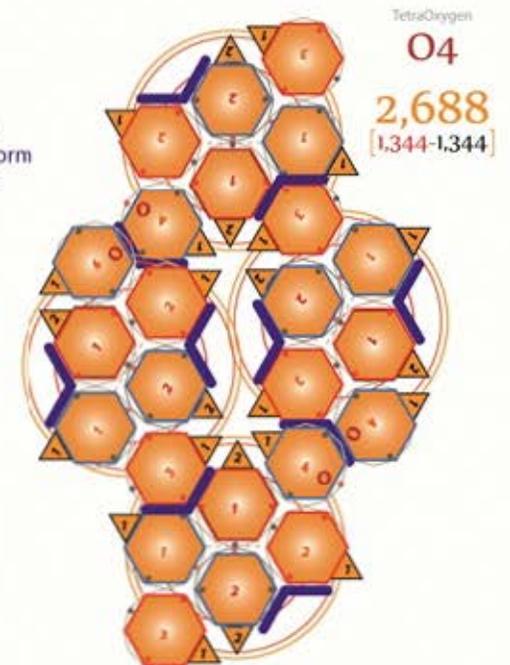
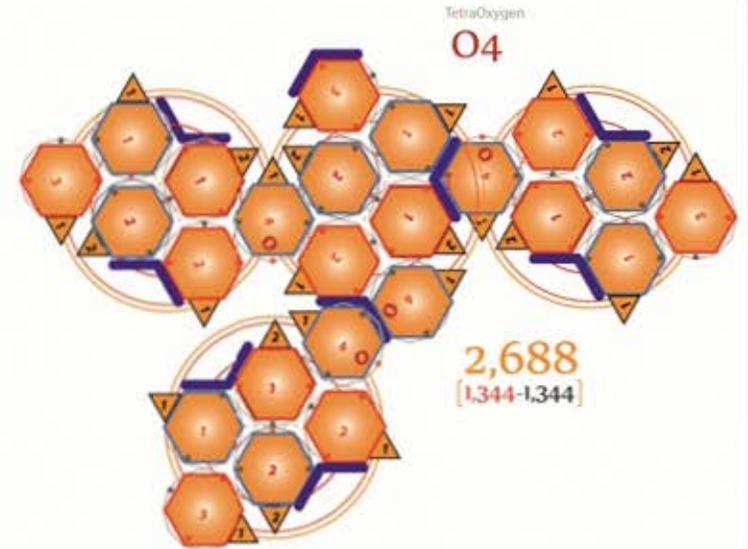
There are several known allotropes of oxygen. The most familiar is molecular oxygen (O2), present at significant levels in Earth's atmosphere and also known as dioxygen or triplet oxygen. Another is the highly reactive ozone (O3).

Others include:
 Atomic oxygen (O1, a free radical)
 Singlet oxygen (O2), either of two metastable states of molecular oxygen
 Tetraoxygen (O4), another metastable form
 Solid oxygen, existing in six variously colored phases, of which one is O8 and another one metallic

Atomic Oxygen also forms bonds easily with Hydrogen to create Hydroxy compounds



All charge fascia interact and bind where possible to form neutral chemical bonds

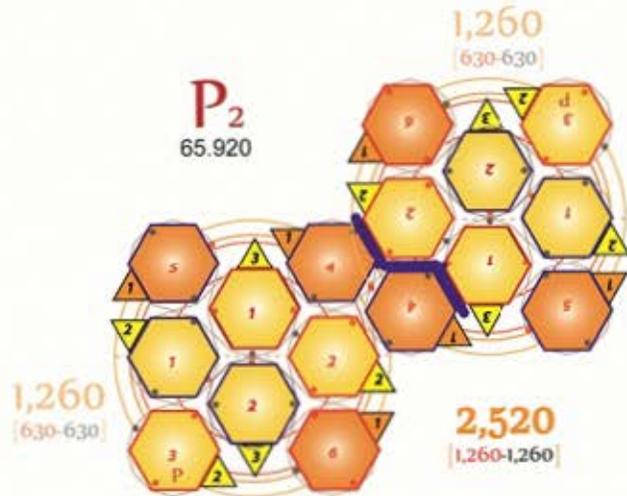
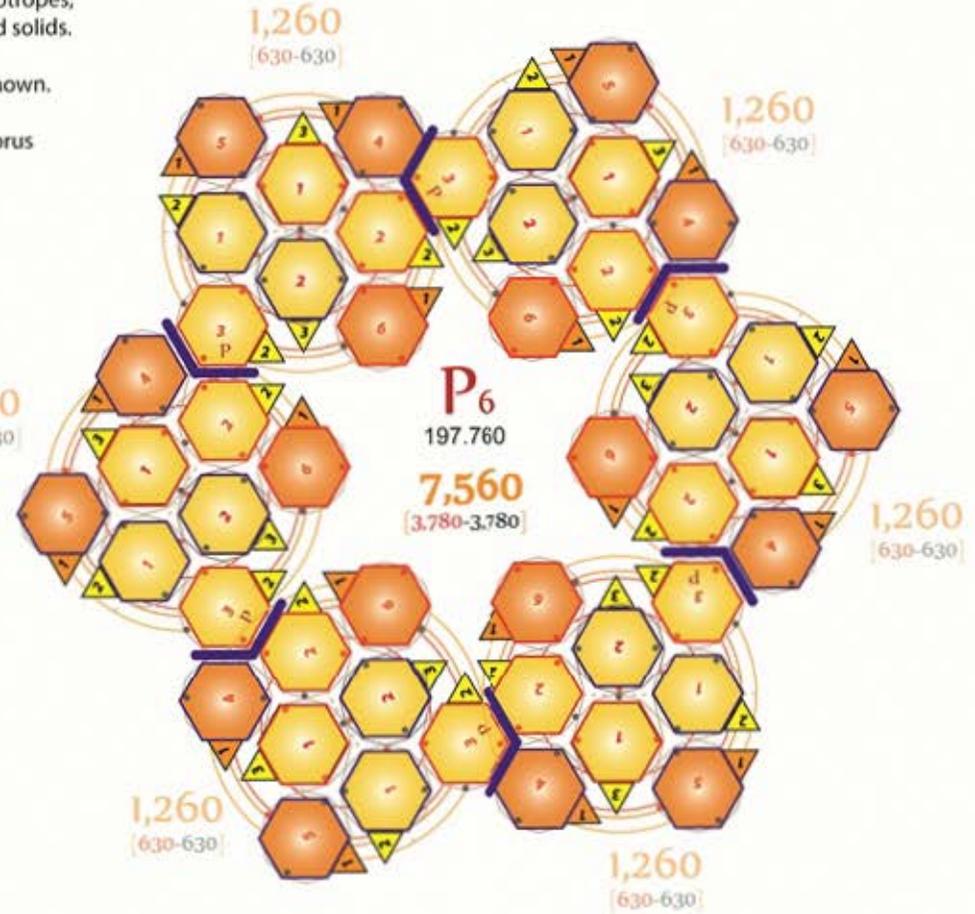


Phosphor Allotropes

Elemental phosphorus can exist in several allotropes; the most common of which are white and red solids.

Solid violet and black allotropes are also known.

Gaseous phosphorus exists as diphosphorus and atomic phosphorus.



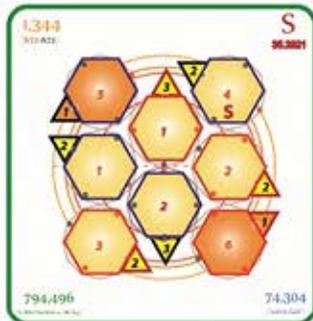
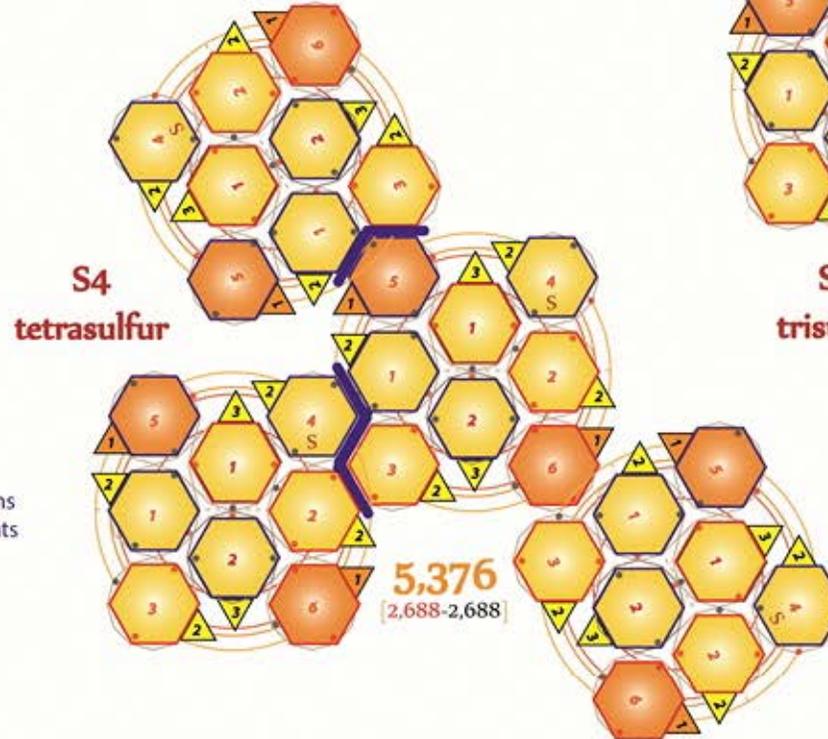
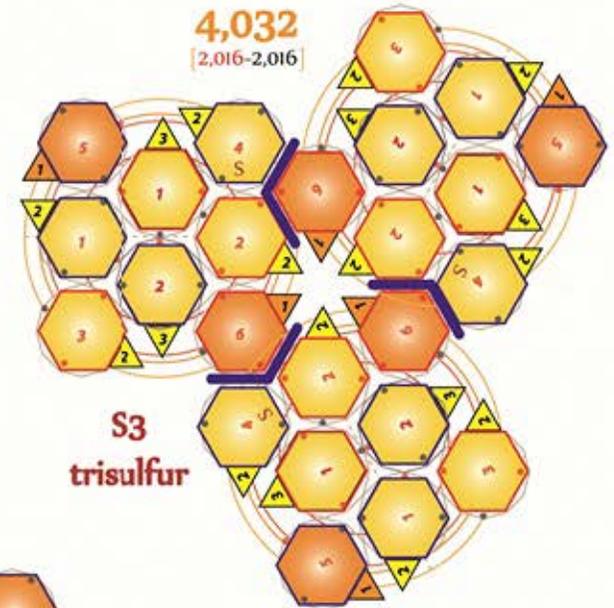
The diphosphorus allotrope (P₂) can be obtained normally only under extreme conditions (for example, from P₄ at 1100 kelvin).

Nevertheless, some advancements were obtained in generating the diatomic molecule in homogenous solution, under normal conditions with the use by some transition metal complexes (based on for example tungsten and niobium).

Black phosphorus is the thermodynamically stable form of phosphorus at room temperature and pressure. It is obtained by heating white phosphorus under high pressures (12,000 atmospheres).

In appearance, properties and structure it is very like graphite, being black and flaky, a conductor of electricity, and having puckered sheets of linked atoms

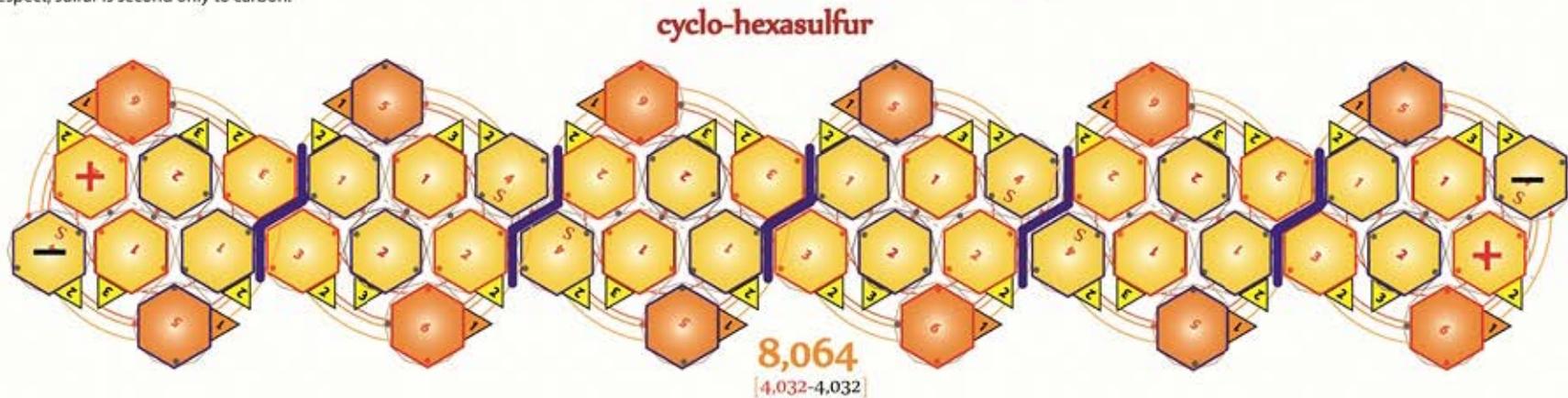
Sulfur Allotropes



Charged fascia interactions between differing elements result in the familiar chemical bonds

Sulfur [like Carbon] can form Chains or Ring compounds

There are a large number of allotropes of sulfur. In this respect, sulfur is second only to carbon.



Isotopes

In addition to forming varying allotropic elements

Atoms can also absorb energy directly and create numerous elemental isotopes as a result of their differing nuclear energy levels

Deuterium nuclei with bound photo-electrons form quantum-scale synchronous converters



n	0 Hydrogen	22,512	24,384	26,352	28,416	30,576	32,832	35,184	37,632
Element	1	2	3	4	5	6	7	8	
1 Deuterium	45,012	48,720	52,596	56,640	60,852	65,232	69,780	74,496	
2 Helium	90,024	97,440	105,192	113,280	121,704	130,464	139,560	148,992	
3 Lithium	135,036	146,160	157,788	169,920	182,556	195,696	209,340	223,488	
4 Beryllium	180,048	194,880	210,384	226,560	243,408	260,928	279,120	297,984	
5 Boron	225,060	243,600	262,980	283,200	304,260	326,160	348,900	372,480	
6 Carbon	270,072	292,320	315,576	339,840	365,112	391,392	418,680	446,976	
7 Nitrogen	315,084	341,040	368,172	396,480	425,964	456,624	488,460	521,472	
8 Oxygen	360,096	389,760	420,768	453,120	486,816	521,856	558,240	595,968	
9 Fluorine	405,108	438,480	473,364	509,760	547,668	587,088	628,020	670,464	
10 Neon	450,120	487,200	525,960	566,400	608,520	652,320	697,800	744,960	
11 Sodium	495,132	535,920	578,556	623,040	669,372	717,552	767,580	819,456	
12 Magnesium	540,144	584,640	631,152	679,680	730,224	782,784	837,360	893,952	
13 Aluminium	585,156	633,360	683,748	736,320	791,076	848,016	907,140	968,448	
14 Silicon	630,168	682,080	736,344	792,960	851,928	913,248	976,920	1,042,944	
15 Phosphorus	675,180	730,800	788,940	849,600	912,780	978,480	1,046,700	1,117,440	
16 Sulfur	720,192	779,520	841,536	906,240	973,632	1,043,712	1,116,480	1,191,936	
17 Chlorine	765,204	828,240	894,132	962,880	1,034,484	1,108,944	1,186,260	1,266,432	
18 Argon	810,216	876,960	946,728	1,019,520	1,095,336	1,174,176	1,256,040	1,340,928	
19 Potassium	855,228	925,680	999,324	1,076,160	1,156,188	1,239,408	1,325,820	1,415,424	
20 Calcium	900,240	974,400	1,051,920	1,132,800	1,217,040	1,304,640	1,395,600	1,489,920	



It is the increased nucleonic energy levels that creates isotopes (not extra Neutrons within an atomic nucleus)



The energy level of Baryons determines the KEM energies of photo-electrons bound to them

Most isotopes are considered to be radioactive as a result of the nuclei seeking to release excess energy in the form of photons of energy or particles with high kinetic energies

Carbon Isotopes

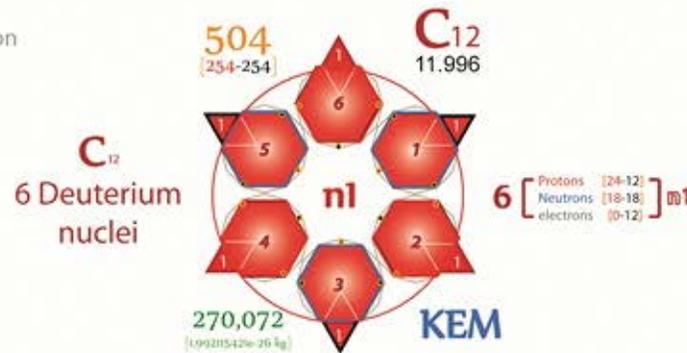
It is widely held in the scientific community that Carbon-14, ^{14}C , or radiocarbon, is a radioactive isotope of carbon with a nucleus containing 6 protons and 8 neutrons.

It is in fact a nucleus comprised of 6 deuterium nuclei [with 6 Protons, 6 Neutrons & 6 electrons]

The mistaken belief in 'extra' neutrons being present in the nucleus stems from the fact that electrons and protons combine in equal numbers in the atomic nucleus and historically attributing the mass in excess of this as being the result of the mass contribution of 'extra' neutrons

Tetryonics finally corrects this erroneous assumption

Carbon 12-14



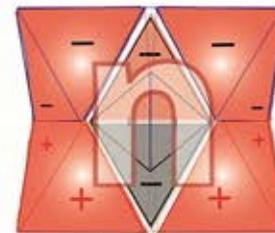
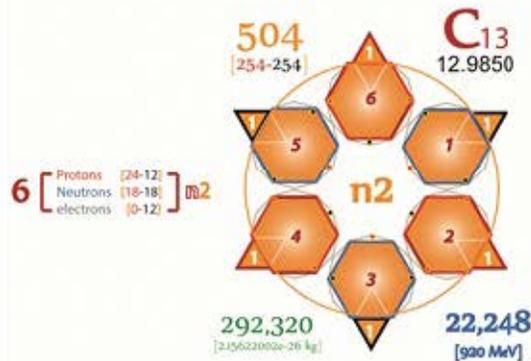
There are NO extra neutrons (in excess of the element's Z#) in the nuclei of atomic isotopes.

The measured 'excess mass' is the direct result of the raised quantum levels of the Deuterium nuclei that comprise each atomic element

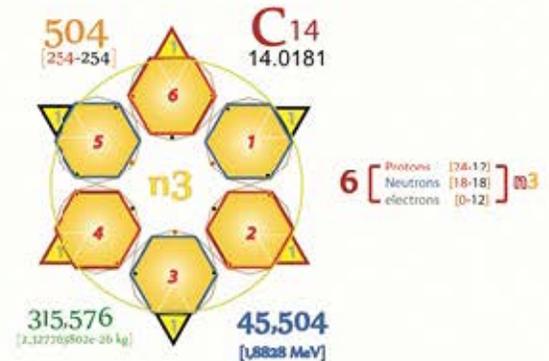
And is completely accounted for in Tetryonic theory by calculating for the total rest mass-energies in each elementary Matter topology.

The 'extra' mass historically attributed to neutron numbers above that of the elemental number are now reflected as stored kinetic 'chemical' energies as they always were.

ALL elements & isotopes have equal numbers of Protons, electrons & Neutrons



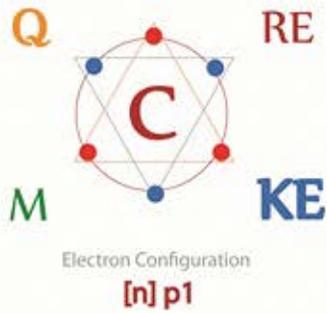
Quantum levels of atomic nuclei contribute to the molar mass [Isotopes are higher energy nuclei]



This applies equally to all atomic nuclei

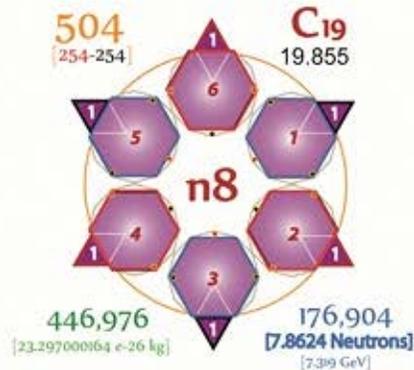
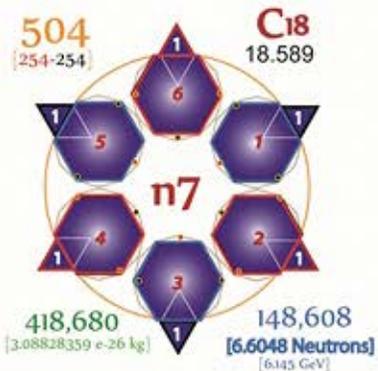
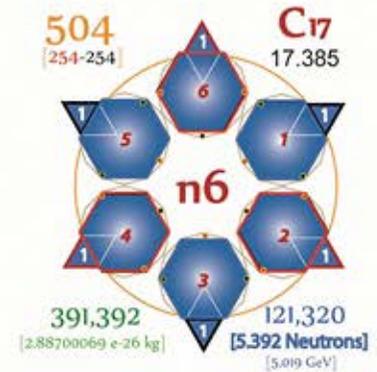
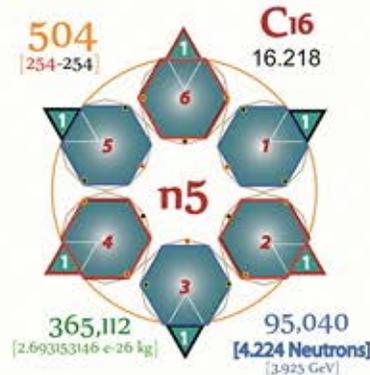
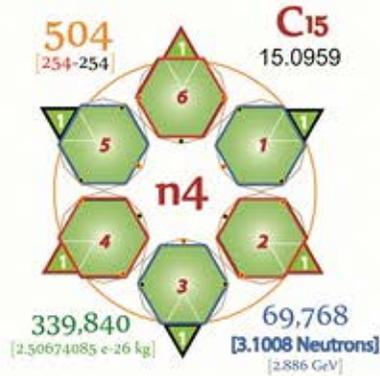
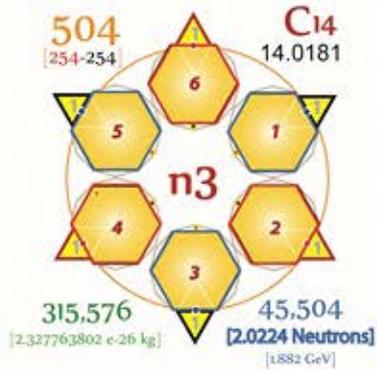
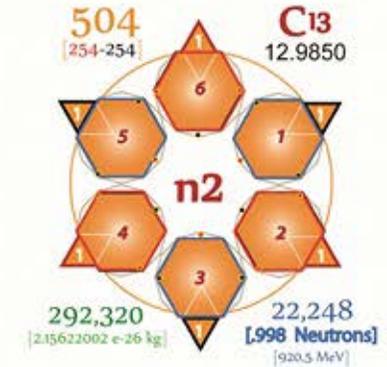
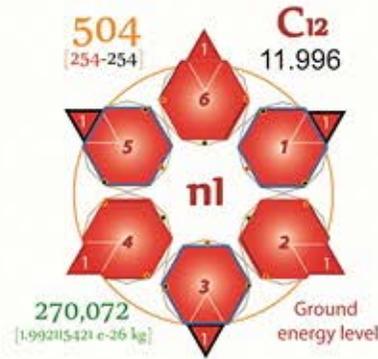
KEM diff
neutron #

	n1	n2	n3	n4	n5	n6	n7	n8
C12	270,072	292,320	315,576	339,840	365,112	391,392	418,680	446,976
	0	22,248	45,504	69,768	95,040	121,320	148,608	176,904
		.98	2.0	3.1	4.2	5.4	6.6	7.8



Atoms store mass-energies in their standing wave Matter topologies and release it via radioactive decay paths

It is increased kinetic energy level geometries that create nuclear isotopes (not extra Neutrons within a nucleus)



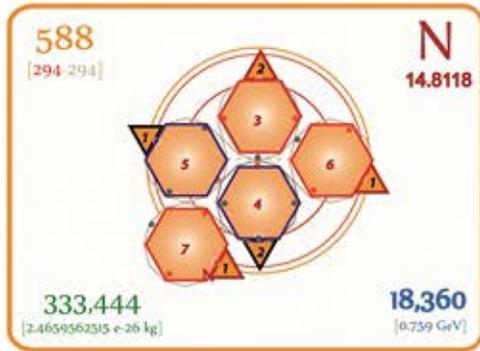
Shell		Nuclei per shell	Molar meM
R	8	446,976	19.855
Q	7	418,680	18.598
P	6	391,392	17.385
O	5	365,112	16.218
N	4	339,840	15.095
M	3	315,576	14.018
L	2	292,320	12.985
K	1	270,072	11.996

22,500 [1 Neutron]
n [930.97 MeV]

Kinetic mass-energy geometries stored in 3D Matter topologies is released as Chemical energies



Deuterium nuclei with bound photo-electrons form quantum-scale synchronous converters



It is increased Nucleonic energy levels that creates isotopes (not extra Neutrons within any elementary Nucleus)

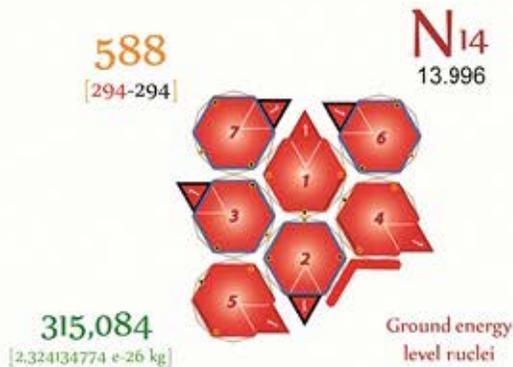
Nitrogen gas



Nitrogen Allotropes & Isotopes



Isotopes are created by increasing the number of Planck mass-energies stored in the standing-wave geometries of chemical elements

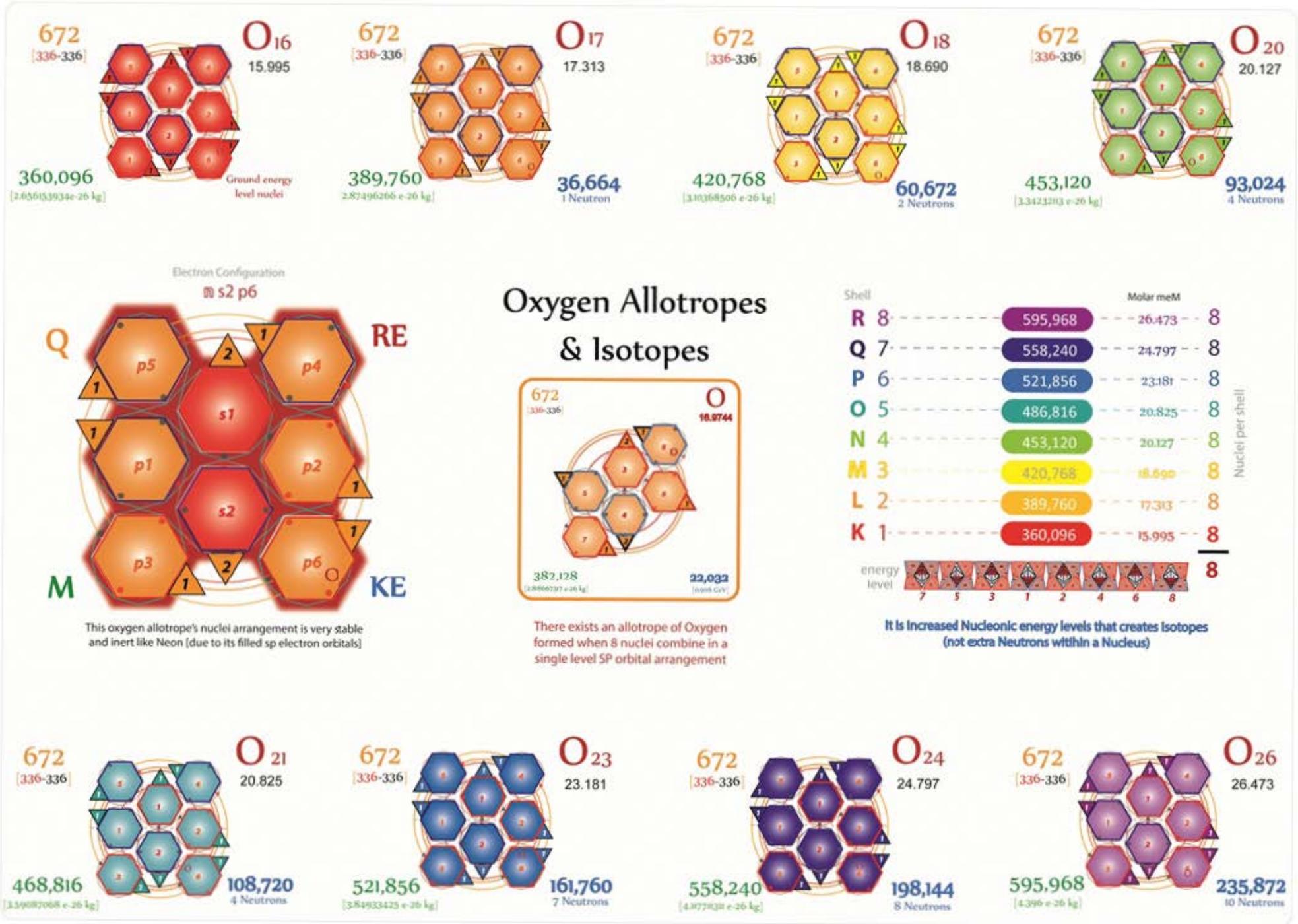


The charged mass-energy geometries of differing allotropic topologies create various chemical bond points

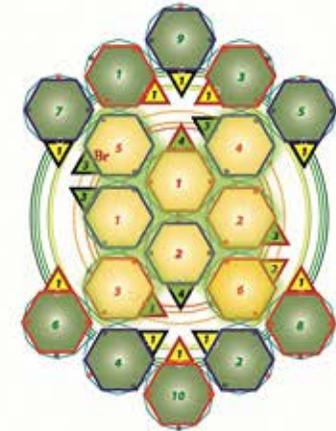
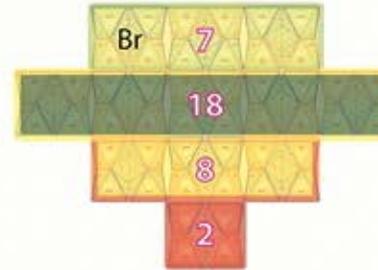
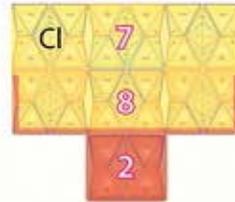
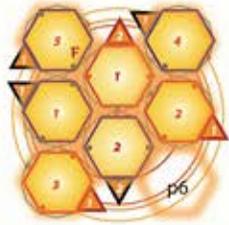
Shell		Molar meM	
R	8	521,472	23.164
Q	7	488,460	21.697
P	6	456,624	20.283
O	5	425,964	18.921
N	4	396,480	17.612
M	3	368,172	16.354
L	2	341,040	15.149
K	1	315,084	13.996
			7

Nuclei per shell

energy level 



Bose-Einstein condensates exist at the low energy extremes



Gaseous

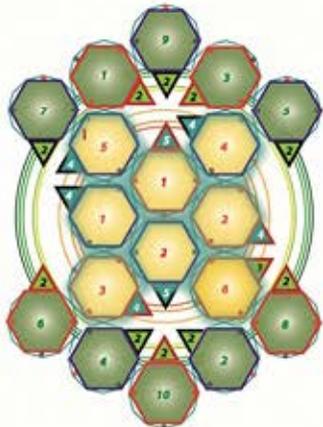
Liquid

The Natural states of Matter (room temperature)

Elements appear in their natural phase at room temperature as a gas, liquid, solid or synthetic

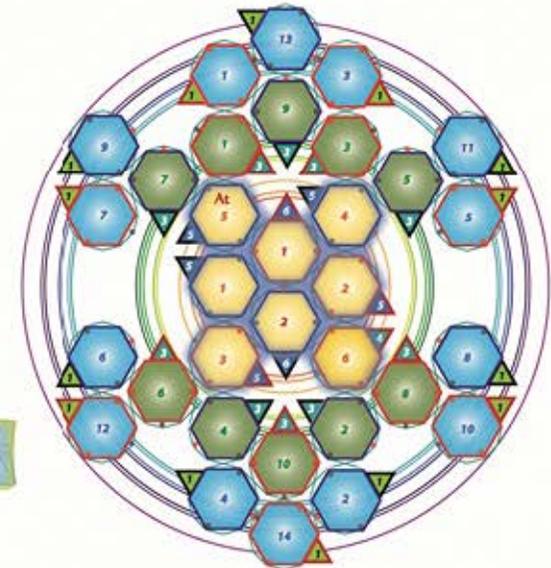
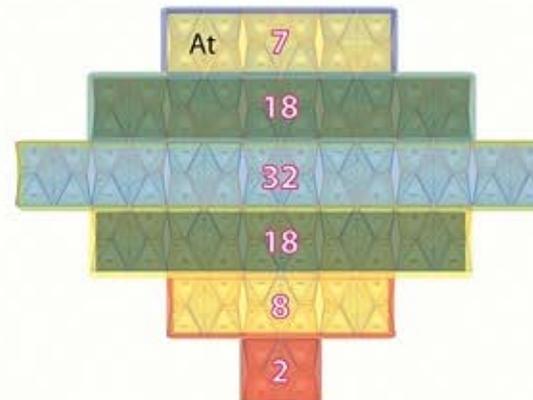
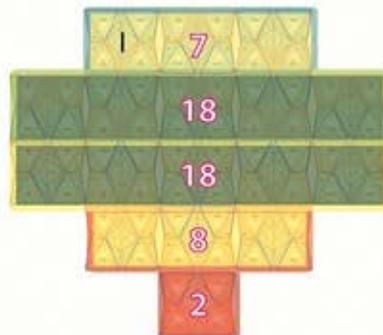
As energy is added or removed from any element's charged Matter topology or their baryonic KEM field geometry their phase states & Brownian motion changes

The halogen element family provides a great example of all 4 states of Matter at room temperature



Solid

Radioactive

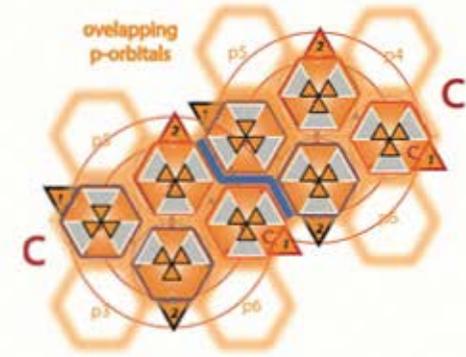
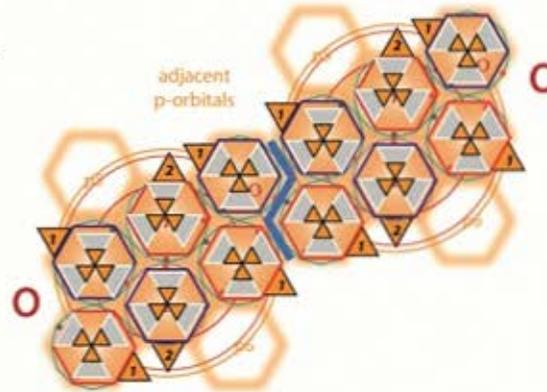
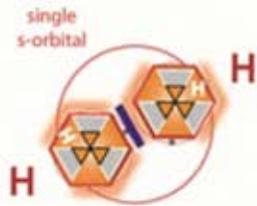


At the high energy extremes exist the Plasma states of Matter

Chemical bonds

A chemical bond is an attraction between atoms that allows the formation of chemical substances that contain two or more atoms.

Particle charge & Inter-fascia electric interaction provides the foundation of chemical bonds



It is usually taught that based on electron sharing principles a single bond contains 2 paired electrons, a double bond has 4 electrons and a triple bond has 6 shared electrons

filled electron shells
[weak KEMical bonds]

single bond

double bond

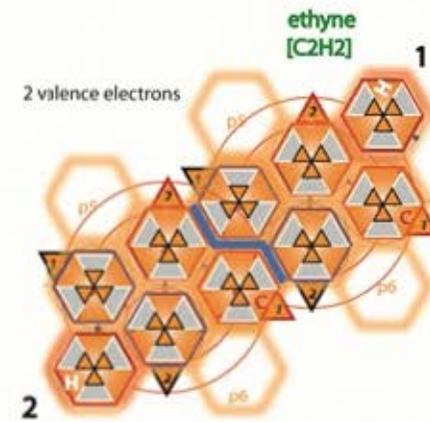
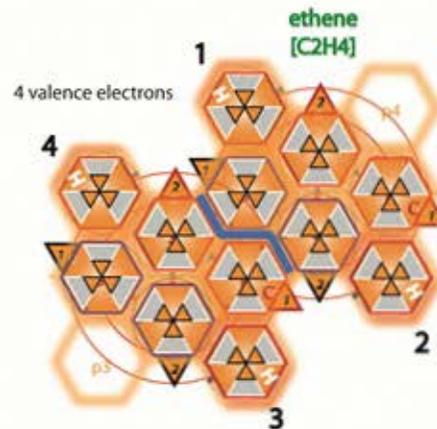
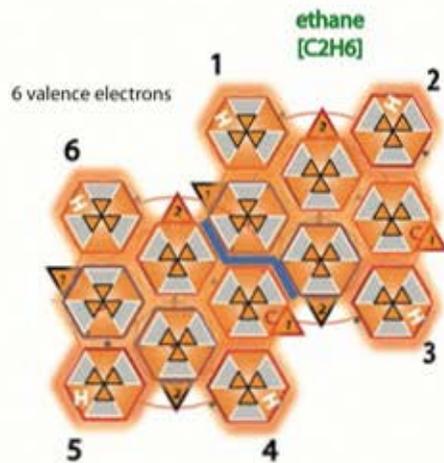
triple bond

Charged baryon fascia and electron sharing both play roles in facilitating chemical bonds

Lewis diagrams are not an accurate representation of chemical bonding in elements or compounds

unfilled electron shells
[stronger KEMical bonds]

Tetryonic geometry provides an advanced quantum topology for all atoms and compounds that is superior to the older Lewis diagrams and even molecular orbital theory, facilitating a clear understanding of the quantum geometry of each element, its nuclear bonds and electron sharing in all compound chemical structures; along with the core & valence electron configurations & interactive electric charge fascia bonding positions for each compound created.

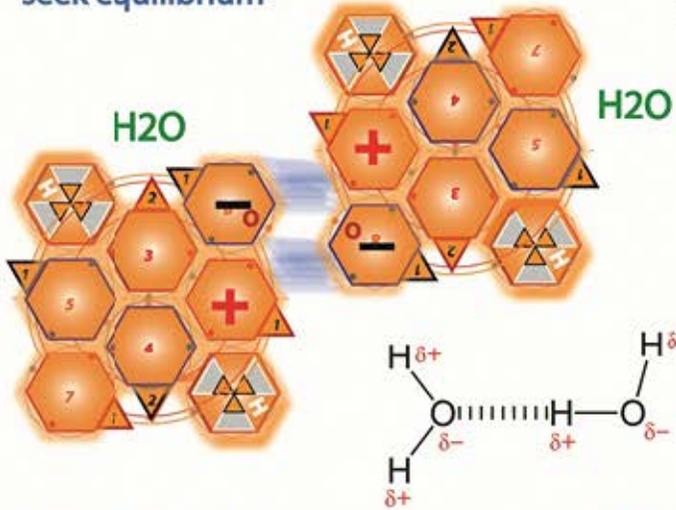


Valence electrons also play an important role in determining the strength of chemical bonds

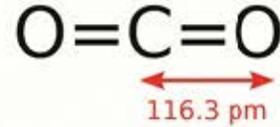
Van der Waals Forces

Van der Waals forces include attractions between atoms, molecules, and surfaces. They differ from covalent and ionic bonding in that they are caused by correlations in the fluctuating polarizations of nearby particles

All charges seek equilibrium



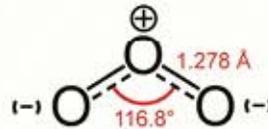
The Forces of interaction can be attractive or repulsive



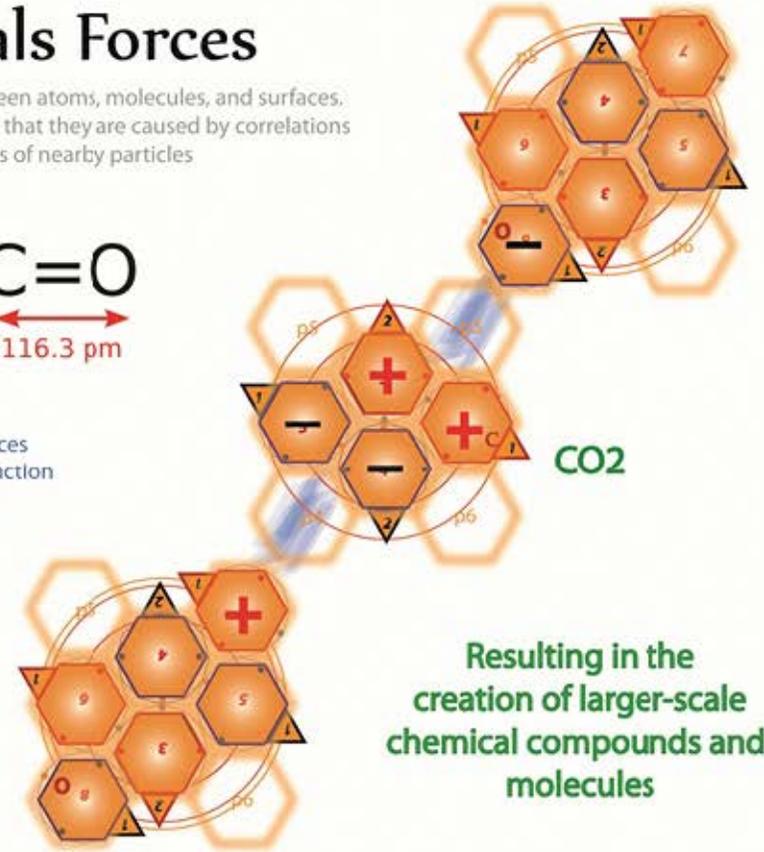
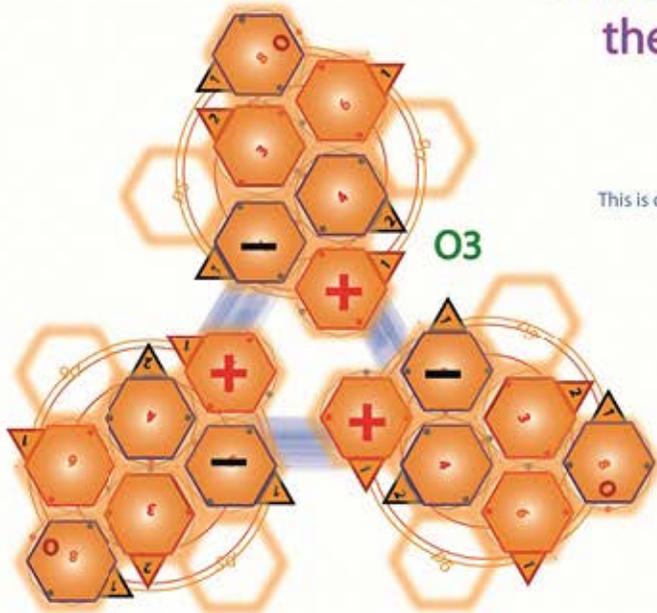
Van der Waals and London forces are the geometric fields of interaction between charged Matter topologies

Residual interactive bonding force between the charged fascia of atoms

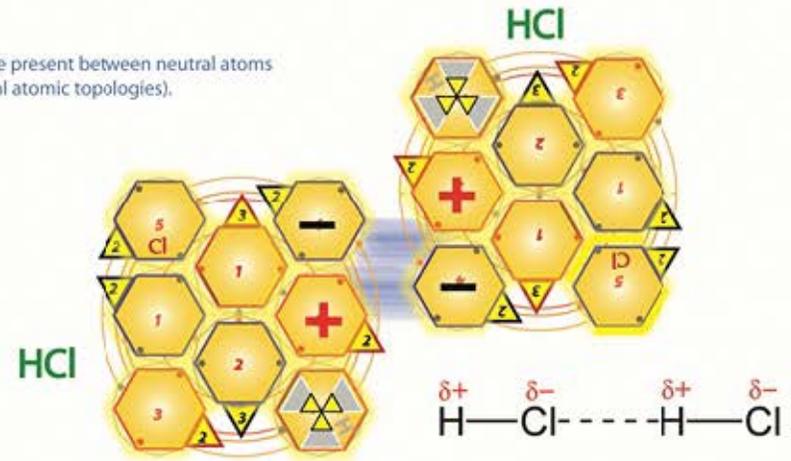
This is considered to be the only attractive intermolecular force present between neutral atoms (e.g., a noble gas configurations and charge neutral atomic topologies).



Without London forces, there would be no attractive force between noble gas atoms, and they wouldn't exist in liquid form.



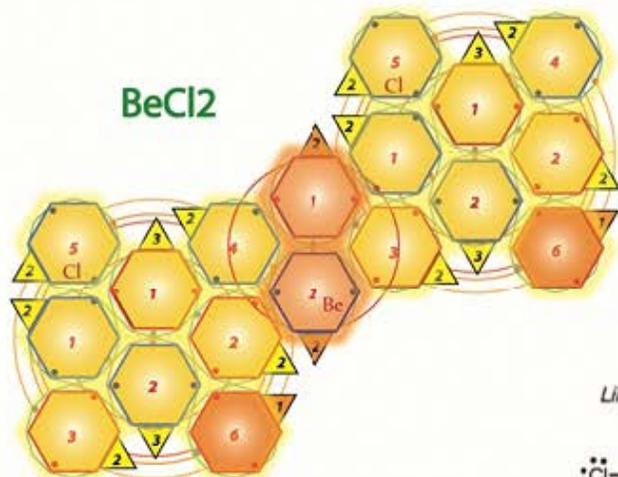
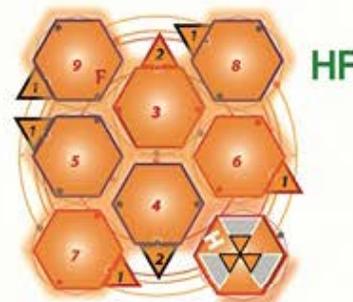
Resulting in the creation of larger-scale chemical compounds and molecules



Lewis Structures

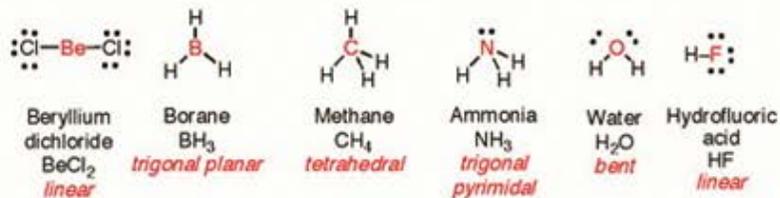
The Lewis structure was named after Gilbert N. Lewis, who introduced it in his 1916 article *The Atom and the Molecule*.

Lewis structures, also called Lewis-dot diagrams, are diagrams that show the bonding between the atoms of any molecule, and the lone pairs of electrons that may exist in the molecule.

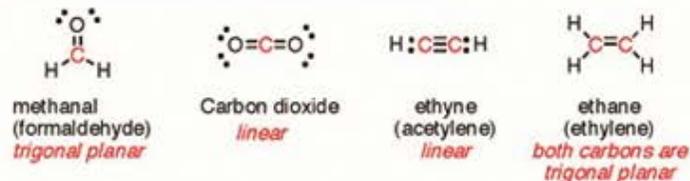


Hydrogen is a 'free radical' atom whose energy can be changed to facilitate chemical bonding between elements

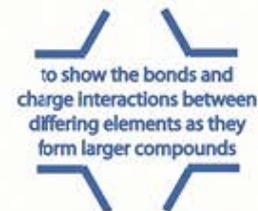
Line drawings can be used to depict molecular geometry:



Also applies to molecules with multiple bonding:

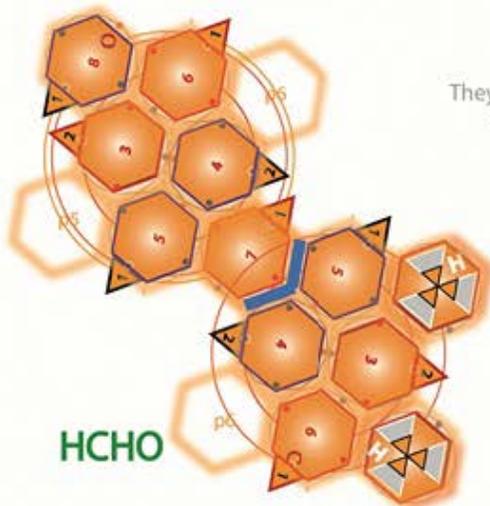


Tetryonic geometry uses the charged geometry of the element fascia themselves



as well as the actual final quantum topology of compound elements and molecules

They are similar to electron dot diagrams in that the valence electrons in lone pairs are represented as dots, but they also contain lines to represent shared pairs in a chemical bond (single, double, triple, etc.).



single fascia bond



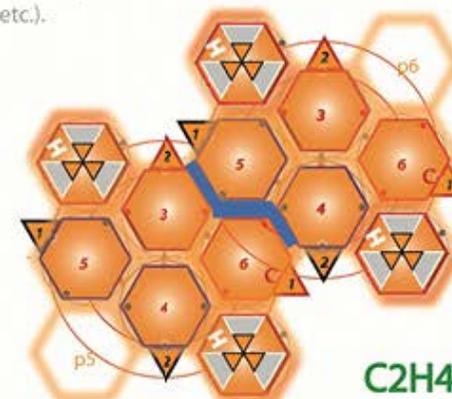
double fascia bonds



triple fascia bond

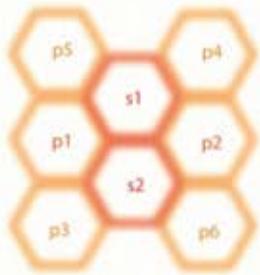


it is the electric field fascia of baryons that facilitates chemical bonds



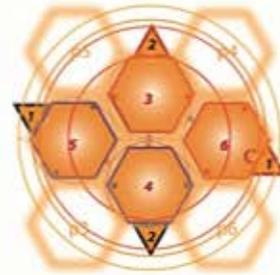
Atomic bonds

All atoms, elements and compounds seek stable core energy & configurations where their electron orbitals are filled



Hydrogen σ bonds

Outward presenting electric fascia bonds
Facilitate bonding between molecules



Molecular π bonds

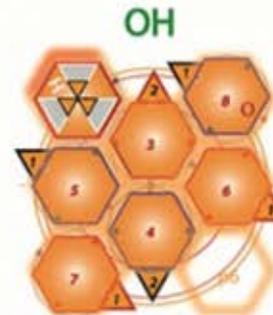
Inward receiving bonds capable of accepting Hydrogen or extra-orbital electric fascia bonds

Bonds fill in order of orbital filling i.e p1-6, d1-10



Core electron configuration

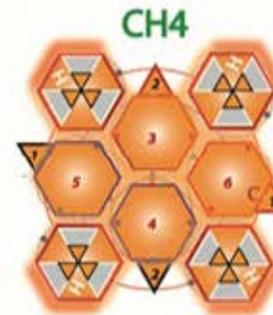
Unreactive [non-valence] electron configuration



Hydroxide bonds

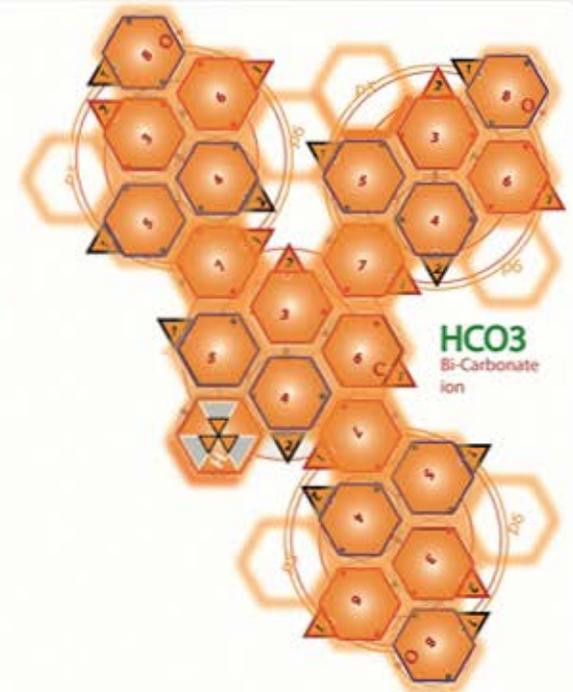
Oxygen-Hydrogen compound creates a halogen-like topology which seeks to fill its p6 orbital in order to reach a stable electronic configuration

Extremely reactive



Covalent bonds

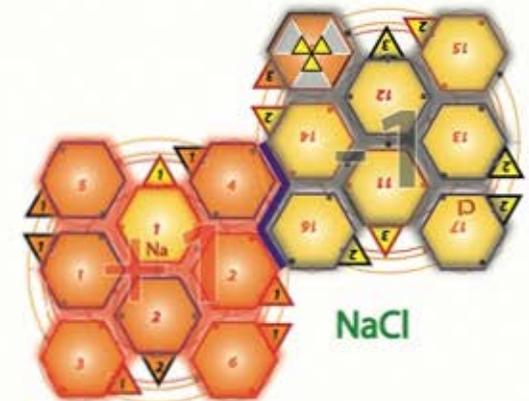
Intra-orbital bonding between elements and compounds where electrons exchange is the main mechanism resulting in stable electronic configurations



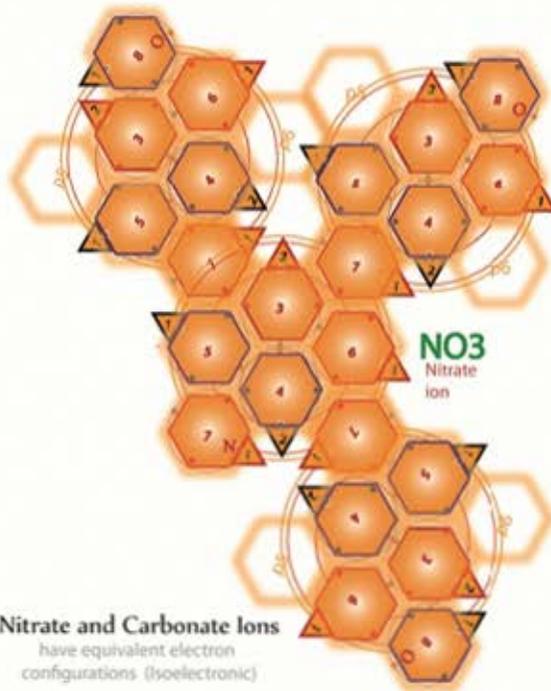
HCO3 Bi-Carbonate ion

Ionic bonds

Extra-orbital bonding between elements and compounds where element charge attraction is the predominant mechanism with electrons sharing resulting in stable electronic configurations



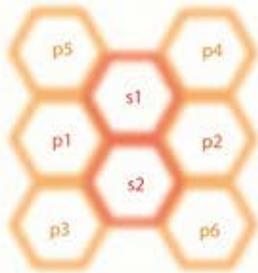
NaCl



Nitrate and Carbonate ions have equivalent electron configurations (isoelectronic)

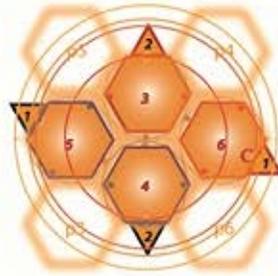
Atomic bonds

All atoms, elements and compounds seek stable core electron configurations where their electron orbitals are filled



Hydrogen Bonds

Outward presenting electric fascia bonds
Facilitate bonding between molecules



Molecular bonds

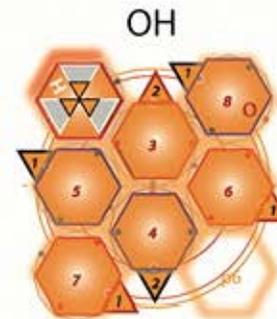
Inward receiving bonds
capable of accepting Hydrogen
or extra-orbital electric fascia bonds

Bonds fill in order of orbital filling
ie p1-6, d1-10



Core electron configuration

Unreactive (non-valence)
electron configuration

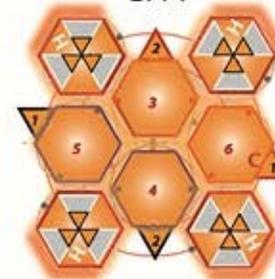


Hydroxide bonds

Oxygen-Hydrogen compound
creates a halogen-like geometry
which seeks to fill its p6 orbital
in order to reach a stable electronic
configuration

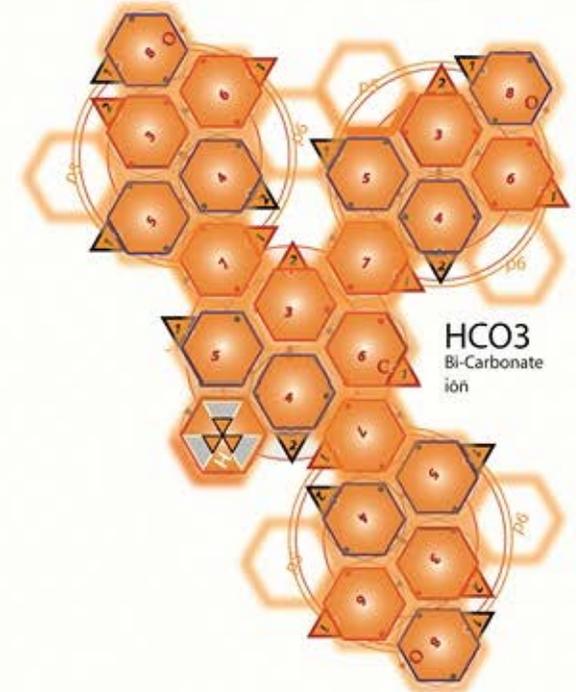
Extremely reactive

CH4



Covalent bonds

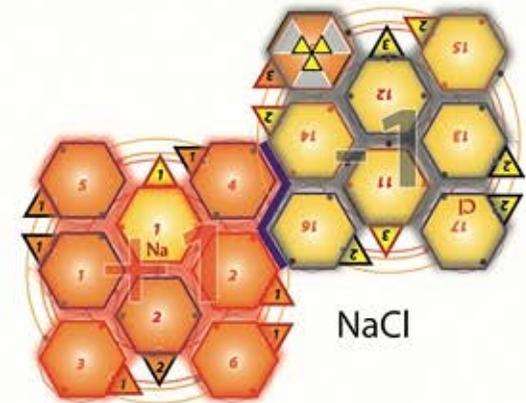
Intra-orbital bonding between
elements and compounds where
electrons exchange is the main
mechanism resulting in
stable electronic configurations



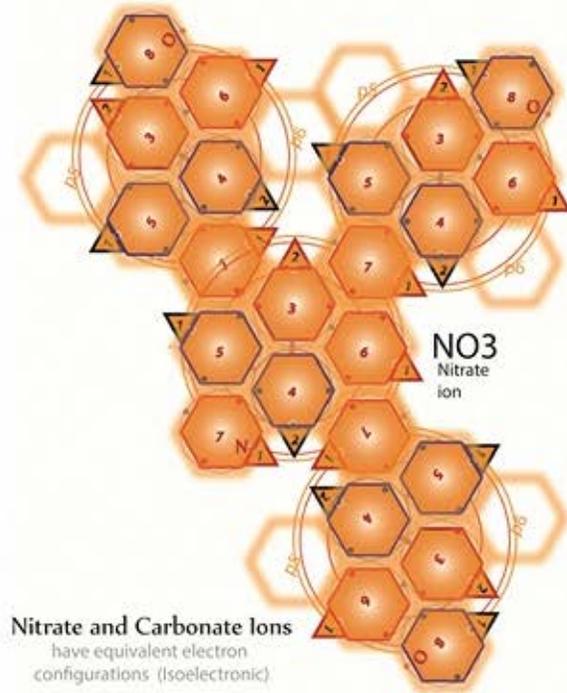
HCO3
Bi-Carbonate
ion

Ionic bonds

Extra-orbital bonding between
elements and compounds where
element charge attraction is the
predominant mechanism
with electrons sharing resulting in
stable electronic configurations



NaCl



NO3
Nitrate
ion

Nitrate and Carbonate ions
have equivalent electron
configurations (isoelectronic)



[He] 2s² 2p⁶
2



[Ne] 3s² 3p⁶
10



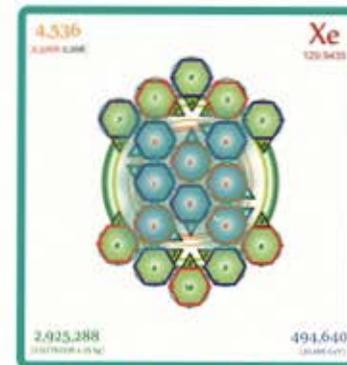
[Ar] 3d¹⁰ 4s² 4p⁶
18

CORE ELECTRON configurations

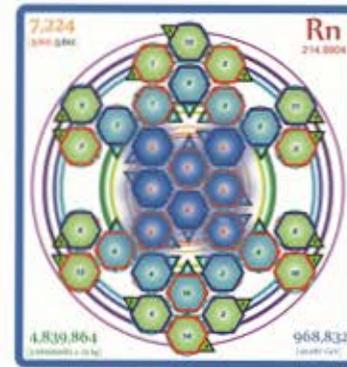
L
M
N
O
P
Q

	1s ²	2s ² 2p ⁶	[He]
	1s ² 2s ² 2p ⁶	3s ² 3p ⁶	[Ne]
	1s ² 2s ² 2p ⁶ 3s ² 3p ⁶ 3d ¹⁰	4s ² 4p ⁶	[Ar]
	1s ² 2s ² 2p ⁶ 3s ² 3p ⁶ 3d ¹⁰ 4s ² 4p ⁶ 4d ¹⁰	5s ² 5p ⁶	[Kr]
	1s ² 2s ² 2p ⁶ 3s ² 3p ⁶ 3d ¹⁰ 4s ² 4p ⁶ 4d ¹⁰ 4f ¹⁴ 5s ² 5p ⁶ 5d ¹⁰	6s ² 6p ⁶	[Xe]
	1s ² 2s ² 2p ⁶ 3s ² 3p ⁶ 3d ¹⁰ 4s ² 4p ⁶ 4d ¹⁰ 4f ¹⁴ 5s ² 5p ⁶ 5d ¹⁰ 5f ¹⁴ 6s ² 6p ⁶ 6d ¹⁰	7s ² 7p ⁶	[Rn]
			[Uuo]

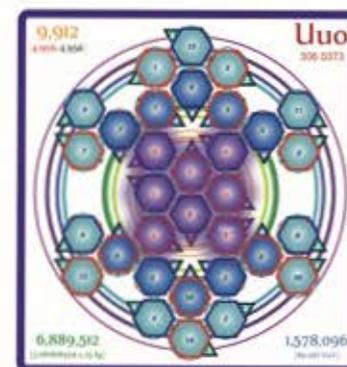
The term "core electrons" or "noble gas core" refers to the electrons within the atom which have the same electron configuration as the nearest noble gas of lower atomic number and contain filled s&p orbitals



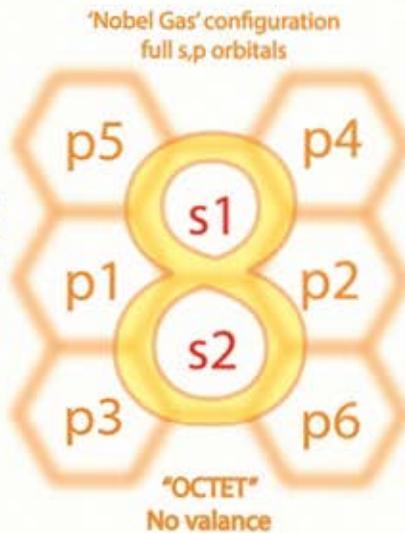
[Kr] 4d¹⁰ 5s² 5p⁶
36



[Xe] 4f¹⁴ 5d¹⁰ 6s² 6p⁶
54



[Rn] 5f¹⁴ 6d¹⁰ 7s² 7p⁶
86



electrons not in filled or complete atomic orbitals are valence electrons

Using core electron notation greatly reduces complexity of the electron configuration notations of larger elements in the periodic table

[Ub] 120	1s ²	2s ²	2p ⁶	3s ²	3p ⁶	3d ¹⁰	4s ²	4p ⁶	5s ²	4d ¹⁰	5p ⁶	4f ¹⁴	5d ¹⁰	6s ²	6p ⁶	5f ¹⁴	6d ¹⁰	7s ²	7p ⁶	8s ²
	2	8	18	32	32	18	8	2												

They are the electrons in the inner part of the atom that are not valence electrons and therefore do not participate in bonding

[Uuo] 8s²
118

Core electron configurations

Core electrons are the electrons in an atom that are not valence electrons and therefore do not participate in bonding.

Reactive

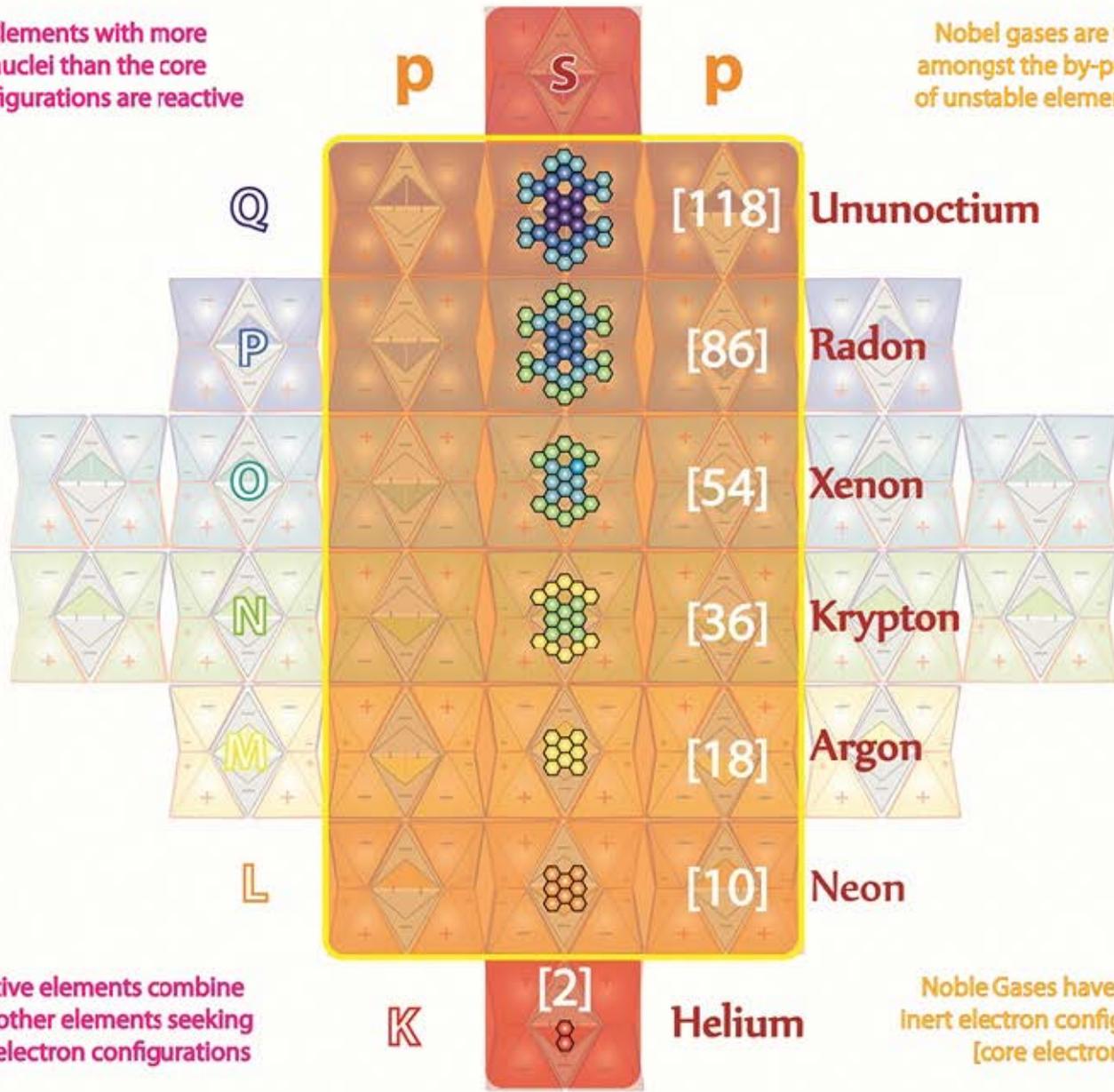
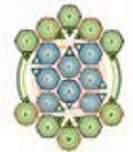
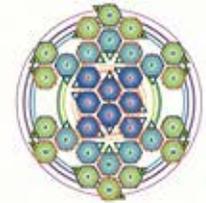
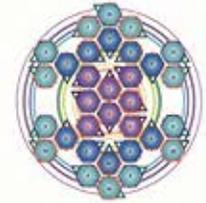
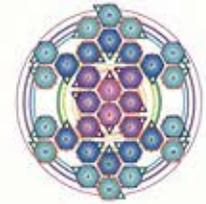
Inert

Elements with more nuclei than the core configurations are reactive

Nobel gases are found amongst the by-products of unstable element decay

Reactive elements combine with other elements seeking core electron configurations

Noble Gases have stable inert electron configurations [core electrons]



!

Helium is a unique noble gas in that it only has filled s-orbitals

suggesting that it be more appropriate to designate it as an alkaline earth gas

He
2,000

filled s electron configuration



Alkaline Earth

168 (8-8)

90,024 (4,001,504 ± 0.1 kg)

2 [Protons (2-2) Neutrons (1-1) Electrons (2-2)] n1

1s2

Ne
20,000

filled s & p electron configuration



840 (40-40)

479,496 (2,013,984 ± 0.1 kg)

10 [Protons (10-10) Neutrons (10-10) Electrons (10-10)] n1-2

(He) 2s2 2p6

29,376 (1,661,280 ± 0.1 kg)

Ar
39,900

filled s & p electron configuration



1,512 (75-75)

899,496 (3,998,880 ± 0.1 kg)

18 [Protons (18-18) Neutrons (20-20) Electrons (18-18)] n1-3

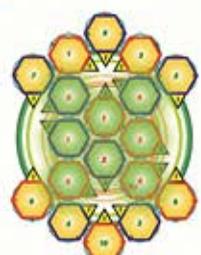
(Ne) 3s2 3p6

89,280 (3,984,000 ± 0.1 kg)

Nobel gases all have inert core sp electron configurations

Kr
83,940

filled s, p & d electron configuration



3,024 (1,512-1,512)

1,876,176 (8,388,000 ± 0.1 kg)

36 [Protons (36-36) Neutrons (48-48) Electrons (36-36)] n1-4

[Ar] 3d10 4s2 4p6

255,744 (1,104,000 ± 0.1 kg)

The Nobel Gases

are nuclei whose electron orbitals are completely filled (and consequently have no valence electrons for bonding)

- 2 [He]
 - 10 [Ne]
 - 18 [Ar]
 - 36 [Kr]
 - 54 [Xe]
 - 86 [Rn]
 - 118 [Uuo]
- 1s2 2s2 2p6
 1s2 2s2 2p6 3s2 3p6
 1s2 2s2 2p6 3s2 3p6 3d10 4s2 4p6
 1s2 2s2 2p6 3s2 3p6 3d10 4s2 4p6 4d10 5s2 5p6
 1s2 2s2 2p6 3s2 3p6 3d10 4s2 4p6 4d10 4f14 5s2 5p6 5d10 6s2 6p6
 1s2 2s2 2p6 3s2 3p6 3d10 4s2 4p6 4d10 4f14 5s2 5p6 5d10 5f14 6s2 6p6 6d10 7s2 7p6

All noble gases have filled electron orbitals creating inert, chemically un-reactive elements

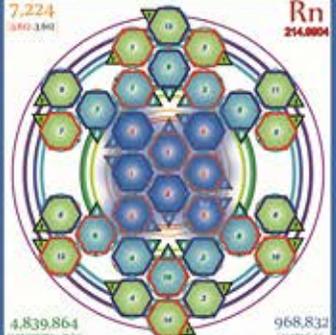
The noble gases are a group of chemical elements with very similar properties: under standard conditions, they are all odorless, colorless, monatomic gases, with a very low chemical reactivity.

Whilst some of the noble gases are often termed core electron configurations the large elements also have filled d & f orbitals in them

The six noble gases that occur naturally are Helium (He), Neon (Ne), Argon (Ar), Krypton (Kr), Xenon (Xe), and the radioactive noble gases are Radon (Rn) and Ununoctium (Uuo).

Rn
222,000

filled s, p, d & f electron configuration



7,224 (3,612-3,612)

4,839,864 (21,588,000 ± 0.1 kg)

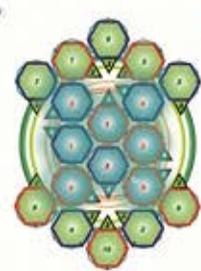
86 [Protons (86-86) Neutrons (136-136) Electrons (86-86)] n1-6

[Xe] 4f14 5d10 6s2 6p6

968,832 (4,281,600 ± 0.1 kg)

Xe
131,000

filled s, p & d electron configuration



4,536 (2,268-2,268)

2,925,288 (12,708,000 ± 0.1 kg)

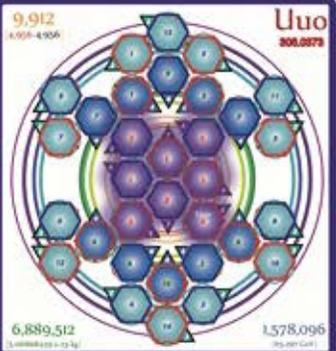
54 [Protons (54-54) Neutrons (78-78) Electrons (54-54)] n1-5

[Kr] 4d10 5s2 5p6

494,640 (2,124,000 ± 0.1 kg)

Uuo
300,000

filled s, p, d & f electron configuration



9,912 (4,956-4,956)

6,889,512 (30,998,000 ± 0.1 kg)

118 [Protons (118-118) Neutrons (182-182) Electrons (118-118)] n1-7

[Rn] 5f14 6d10 7s2 7p6

1,578,096 (6,961,600 ± 0.1 kg)

Molecular Bonds

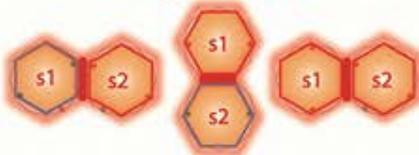
Hydrogen bonds



A weak, primarily electrostatic, bond between a hydrogen atom bound to a highly electronegative element in a given molecule and a second highly electronegative atom in another molecule

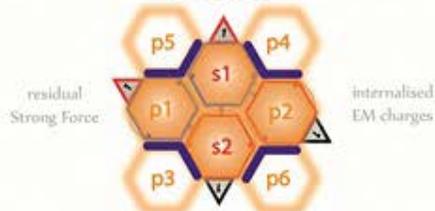
Diatomic bonds are fascia interactions between molecules with the same nuclei number
[O₂, F₂, I₂, Cl₂]

Sigma bonds



The residual EM force between opposite charge fascia in nuclei holds individual nuclei together in turn resulting in larger molecules and compounds

Pi bonds



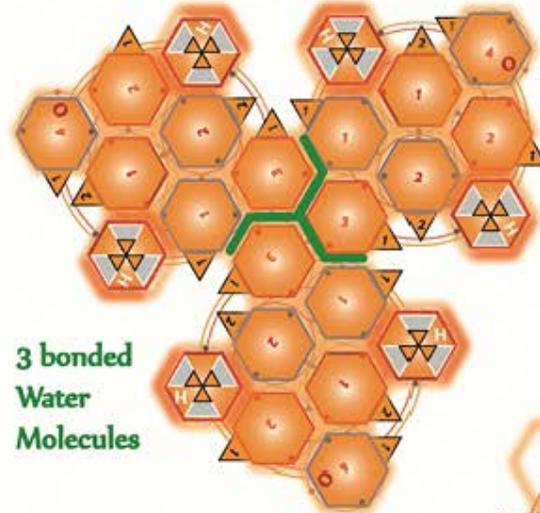
Molecular bonds



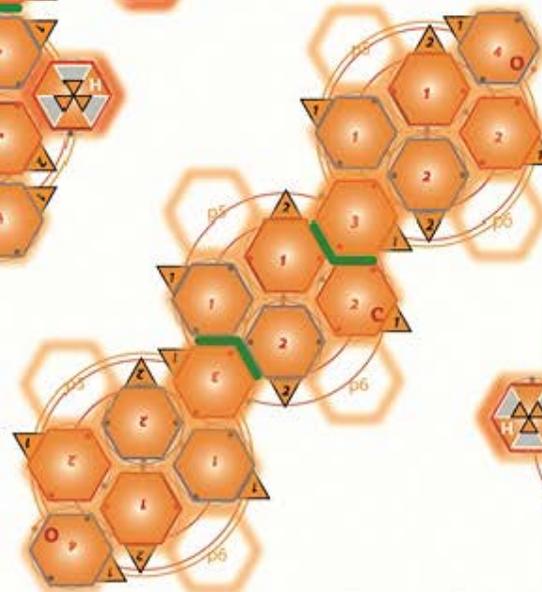
A molecular bond is an attractive force between nuclei that allows two or more elements or atoms to combine into a singular, complex compound structure



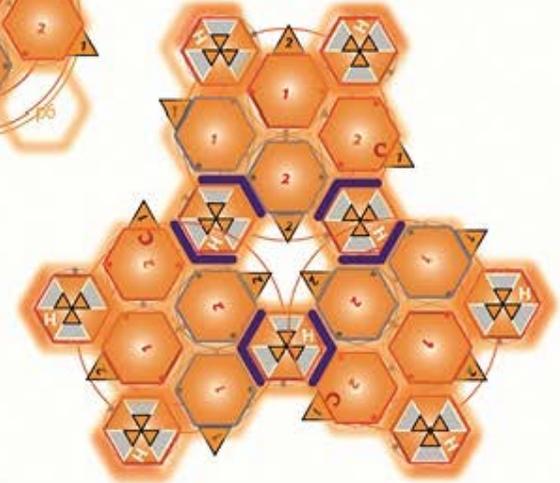
Tetryonic mass-energy geometries & 3D Matter topologies provide for the modelling of even the most complex chemical bonding arrangements



Carbon Dioxide Molecule



Trishexane Molecule



Covalent bonds are chemical links between two atoms in which electrons are shared between them.



Sigma bonds are covalent bonds formed by direct overlapping of two adjacent atom's outermost orbitals.

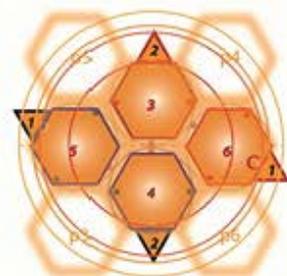


Note: sigma bonds can be formed by the bonding of either s-orbitals [or two adjacent p-orbitals]

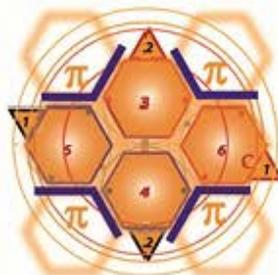
Lewis electron dot diagrams fail to illustrate reality in that molecules exist as 3D objects and not as a two dimensional systems as shown by them.

Tetryonic geometry & topologies provide a polar view of 3D atomic nuclei that can be viewed as an exact representation of what a molecule & its bonds would look like when viewed from above.

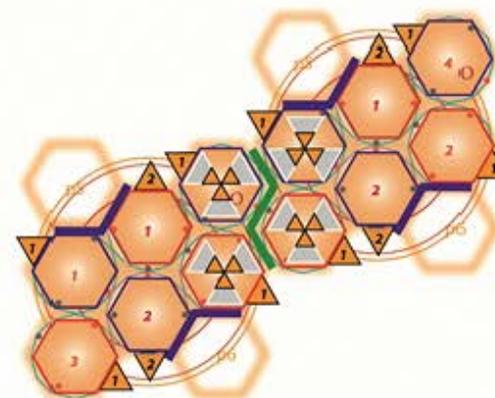
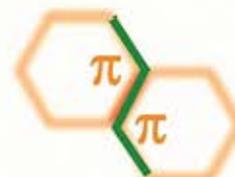
Sigma & Pi covalent bonds



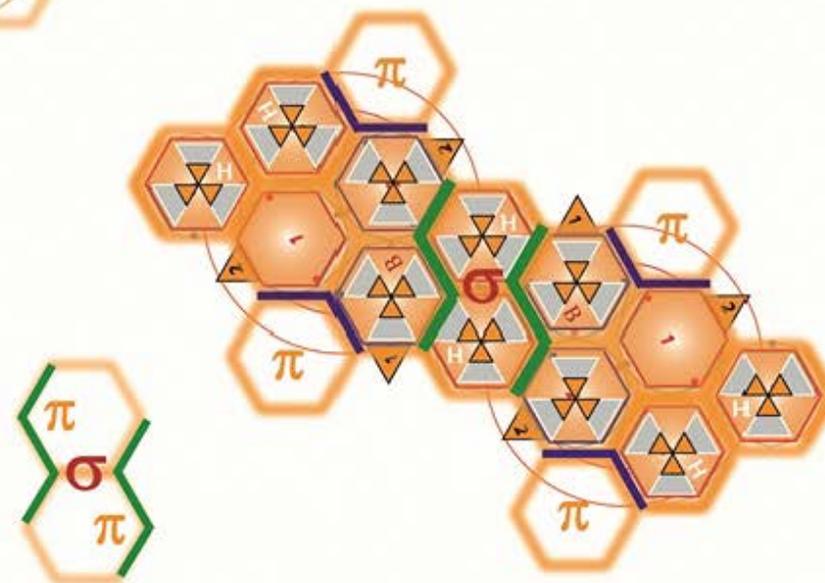
A pi bond is a covalent bond formed between two neighboring atom's unbonded p-orbitals.



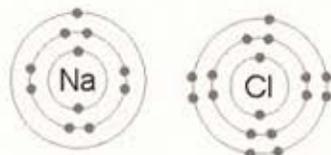
The single electrons from each atom's p orbital combine to form an electron pair creating the sigma bond.



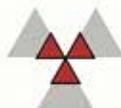
Double and triple bonds between atoms are usually made up of a single sigma bond and one or two pi bonds



Alkali Metals



Valence electrons



are the highest energy electrons in an atom forming the outermost electrons of an atom, and are important in determining how the atom reacts chemically with other atoms

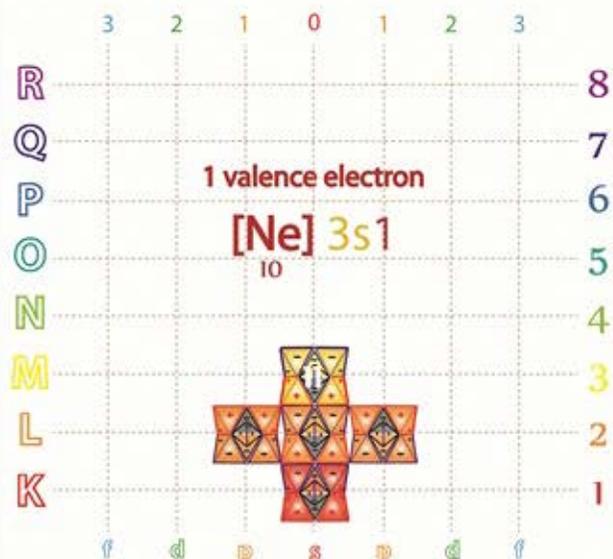
Historically, the number of valence electrons was reflected by the element's group number in the Mendeleev table and formed the basis of elemental families

Tetryonic topologies now replace the older, incorrect models of valence electron configurations with the full 3D modelling of all atoms, elements & compounds

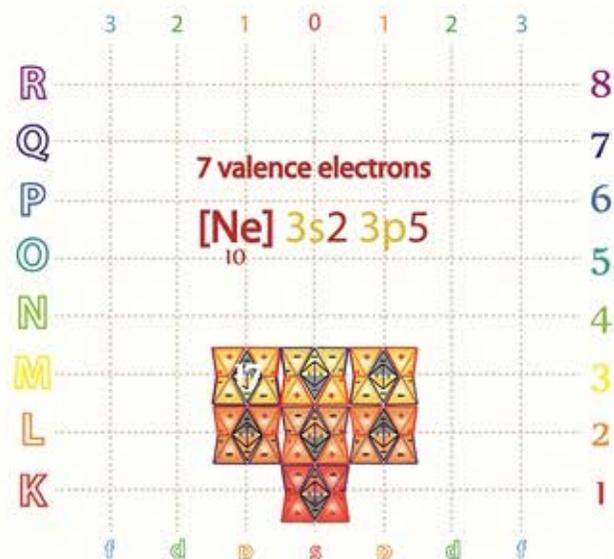
[zz] are core electron configurations

providing a superior visual means of accurately determining the energies and position of any electron in chemical compounds and determining the valence numbers

Halogens



Atoms with more electrons than a closed shell are also highly reactive, as the extra valence electrons are easily removed from that orbital (to form a positive ion)



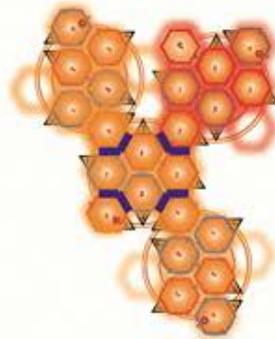
Atoms one or two valence electrons short of a closed shell are highly reactive, due to their tendency to seek to gain the missing valence electrons (thereby forming a negative ion)

Hydro-Chloric acid



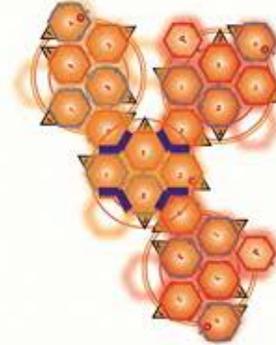
HCl

HNO₃



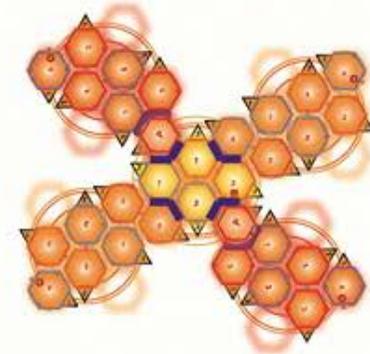
Nitric acid

Carbonic acid



H₂CO₃

H₂SO₄



Sulfuric acid

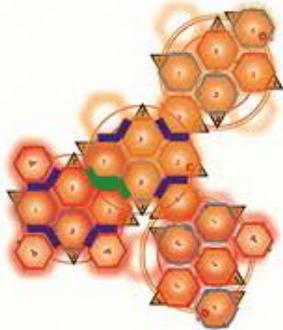
Common Acids

The Arrhenius definition defines acids as substances which increase the concentration of hydrogen ions (H⁺), or more accurately, hydronium ions (H₃O⁺), when dissolved in water.

The Bronsted-Lowry definition is the most widely used definition where acid-base reactions are assumed to involve the transfer of a proton (H⁺) from an acid to a base.

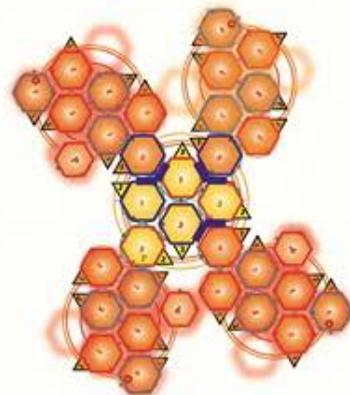
A Lewis acid is a substance that can accept a pair of electrons to form a covalent bond.

HC₂H₃O₂



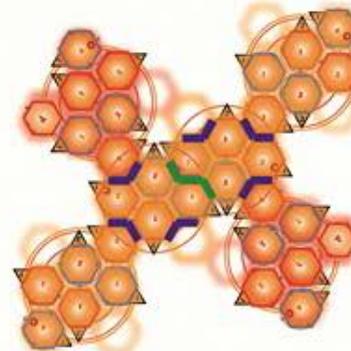
Acetic acid

Phosphoric acid



H₃PO₄

H₂C₂O₄



Oxalic acid

Citric acid



H₃C₆H₅O₇

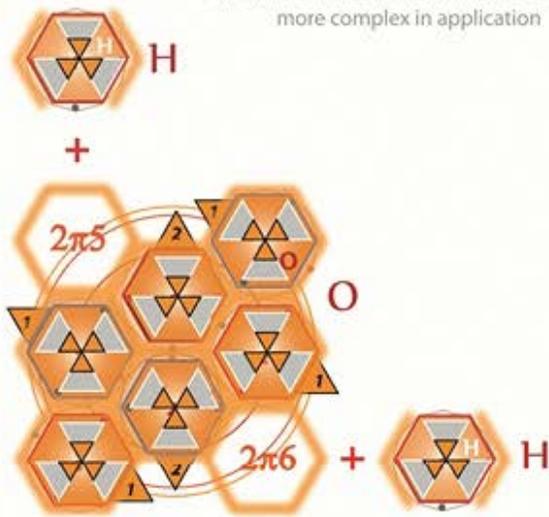
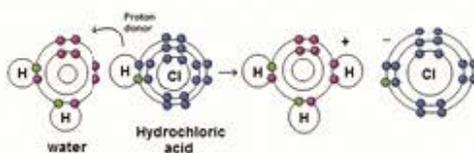
Chemical reactions

Valence Bonds & Molecular orbitals

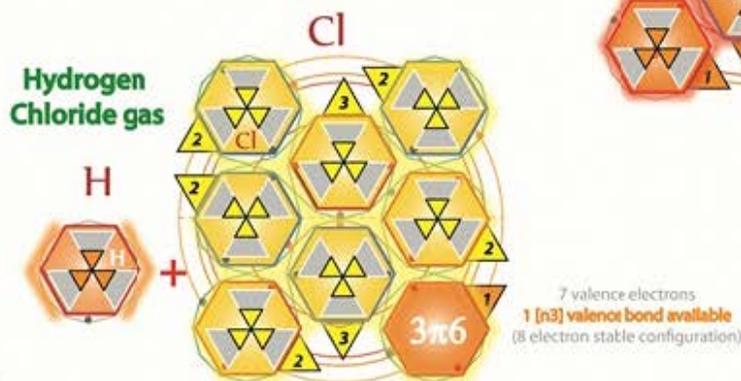
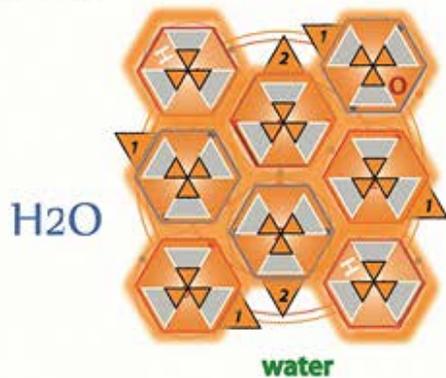
A chemical reaction is a process that leads to the transformation of one set of chemical substances to another.

In contrast, molecular orbital theory has orbitals that are designed to cover the whole molecule but is mathematically more complex in application

Valence bond theory focuses on how the atomic orbitals of the dissociated atoms combine in molecular formations to give rise to individual chemical bonds.



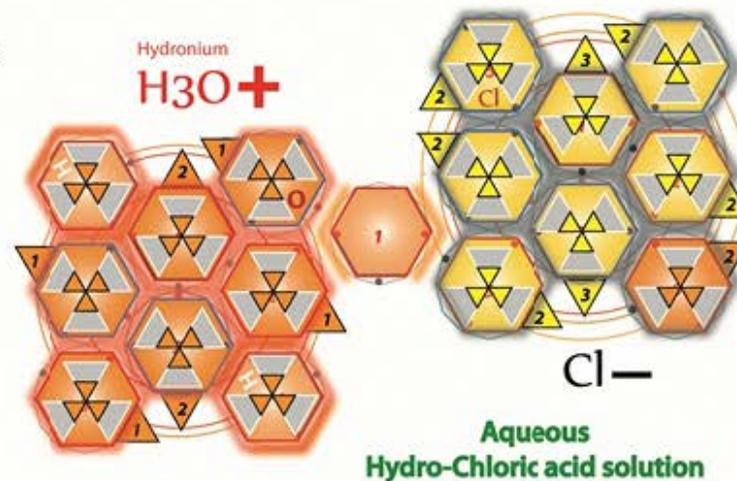
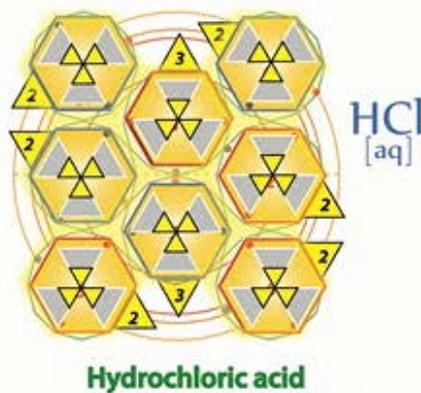
6 valence electrons
2 [n2] valence bonds available
(8 electron stable configuration)



7 valence electrons
1 [n3] valence bond available
(8 electron stable configuration)

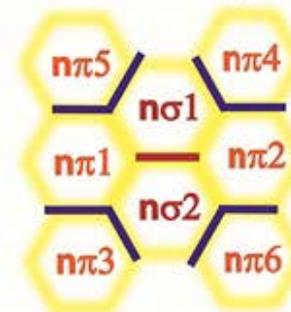
In order to form Hydro-chloric acid [HCl aq] and bond with similar water [H₂O] molecules, the n2 Hydrogen atom's energy must be raised so it can migrate to the [3n6] orbital and bond

[n2] Hydrogen atom cannot bond in the [3n6] valence position so in HCl gas it forms a [n2] di-atomic bond instead and its electron migrates to the [n6] orbital



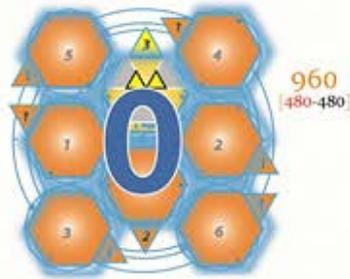
Tetryonic theory replaces both VB & MO theories by modelling the physical quantum charge topologies and rest mass-energy geometry of all elements and compounds

Valence configurations seek to create stable filled orbital configurations



Building on existing electron configuration nomenclature tetryonic theory provides a new bonding schema for elements and complex compounds alike that is fully reflective of the physical quantum charge interactions

Ionic Bonding



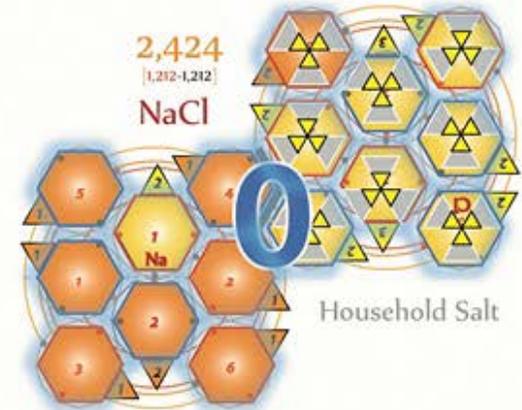
Alkaline Metal

Sodium atom gives up an electron in order to create a stable [Ne] noble gas configuration.

Sodium atom develops into a net **POSITIVE** charge ion

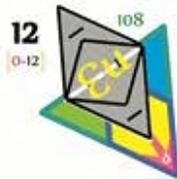


OPPOSITES ATTRACT



Household Salt

Resultant salt [NaCl] molecule has a **NEUTRAL** charge with the n3 electron migrating to fill the 3p6 orbital



Chlorine atom seeks an electron in order to create a stable [Ar] noble gas configuration



Chlorine atom develops into a net **NEGATIVE** charge ion

Halogen

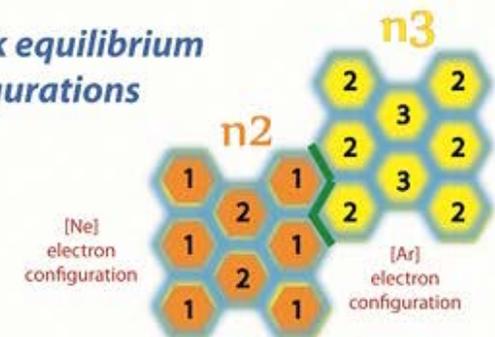


All atoms and molecules seek equilibrium via stable electron configurations

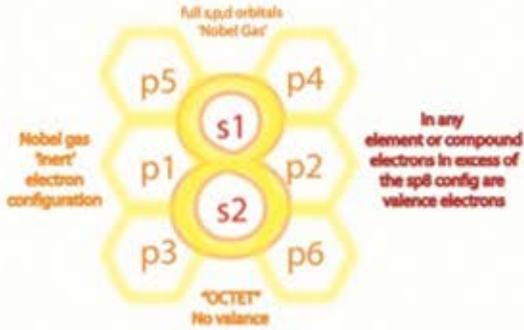
In short, it is a bond formed by the attraction between two oppositely charged ions.

An ionic bond (or electrovalent bond) is a type of chemical bond that can often form between metal and non-metal ions (or polyatomic ions such as ammonium) through electrostatic attraction.

The metal donates one or more electrons, forming a positively charged ion or cation with a stable electron configuration. These electrons then enter the non metal, causing it to form a negatively charged ion or anion which also has a stable electron configuration. The electrostatic attraction between the oppositely charged ions causes them to come together and form a bond.



Valence electron rules



In any element or compound electrons in excess of the sp8 config are valence electrons

sp8 - core electron orbital grouping

Tetryonic quantum charge topologies provide the complete picture

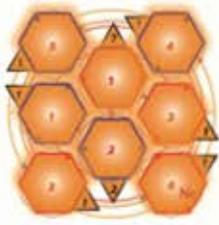
Valence electrons are the highest quantum level electrons in elemental or compound atom nuclei in excess of the core sp8 'noble gas' electron configuration

They are located in the outer most shells (ie K-Q or Quantum 1-7) making them easily ionised from the elemental nuclei

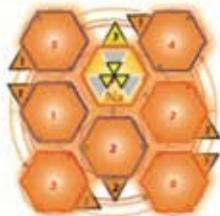
- s 1-2 [electron orbital pair]
- p 1-2, 3-4, 5-6 [electron orbital pairs]
- d 1-2, 3-4, 5-6, 7-8, 9-10 [electron orbital pairs]
- f 1-2, 3-4, 5-6, 7-8, 9-10, 11-12, 13-14 [electron orbital pairs]

Valence electron configurations always include 's' orbital electrons due to their higher quantum levels

Developed from Lewis diagrams is usually only useful for elements Z<20



Neon
[He] 2s2, 2p6



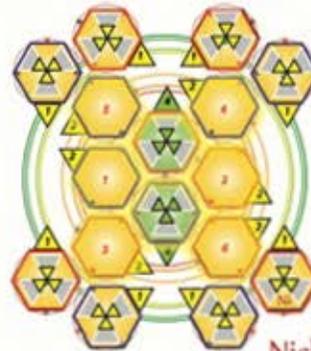
Sodium
[Ne] 3s1
Valence - 1



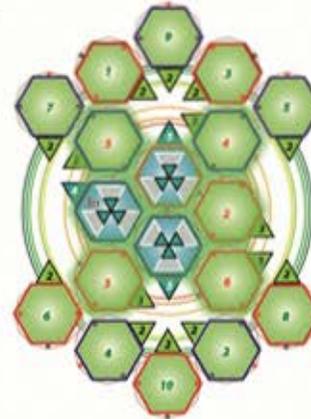
Fluorine
[He] 2s2, 2p5
Valence - 7



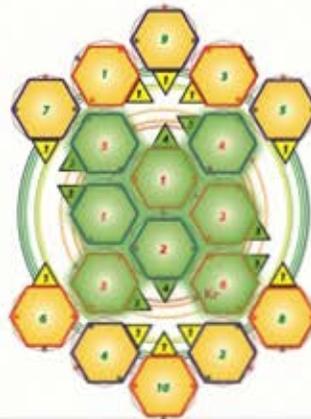
Scandium
[Ar] 3d1, 4s2
Valence - 3



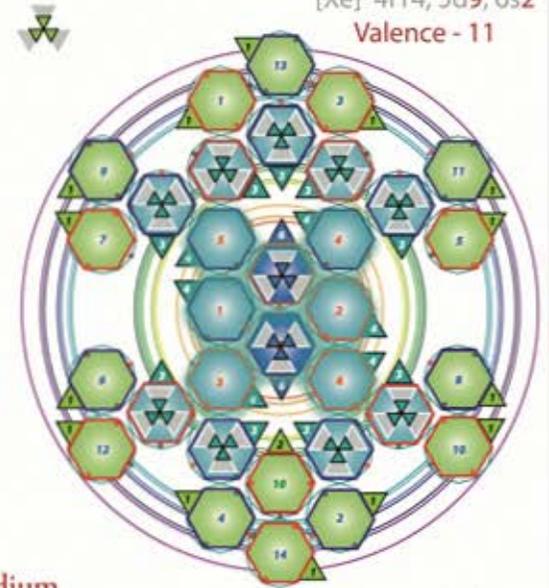
Nickel
[Ar] 3d8, 4s2
Valence - 10



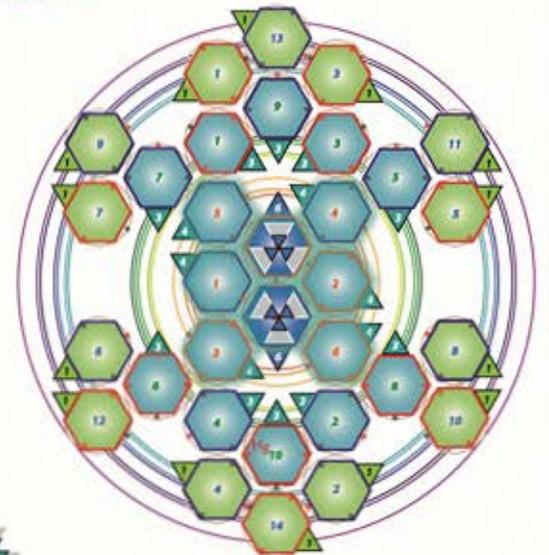
Indium
[Kr] 4d10, 5s2, 5p1
Valence - 3



Krypton
[Ar] 4s2, 4p6



Gold
[Xe] 4f14, 5d9, 6s2
Valence - 11



Mercury
[Xe] 4f14, 5d10, 6s2

Filled electron orbitals

The octet rule is a simple chemical rule of thumb that states that atoms tend to combine in such a way that they each have eight electrons in their valence shells, giving them the same electronic configuration as a noble gas.

The rule is applicable to the main-group elements, especially carbon, nitrogen, oxygen, and the halogens, but also to metals such as sodium or magnesium. In simple terms, molecules or ions tend to be most stable when the outermost electron shells of their constituent atoms contain eight electrons.

In short, an element's valence shell is full and most stable when it contains eight electrons, corresponding to an s^2p^6 electron configuration.

CORE ELECTRONS

This stability is the reason that the noble gases are so unreactive, for example neon with electron configuration $1s^2 2s^2 2p^6$. (Helium is an exception as explained).

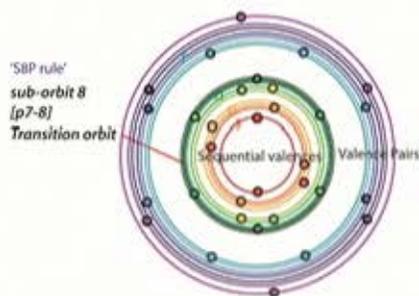
Note that a "full shell" means that there are the eight electrons in the valence shell when the next shell starts filling, even though higher subshells (d, f, etc.) have not been filled.

There can be at most eight valence electrons in a ground-state atom because p subshells are always followed by the s subshell of the next shell.

OCTET RULE

This means that once there are 8 valence electrons (when the p subshell is filled), the next additional electron goes into the next shell, which then becomes the valence shell.

A consequence of the octet rule is that atoms generally react by gaining, losing, or sharing electrons in order to achieve a complete octet of valence electrons. Reaction of atoms occurs primarily in two ways: ionically and covalently.



Once 8 valence electrons are reached the sub-orbits are stable and form a stable, non-reactive valence configuration.

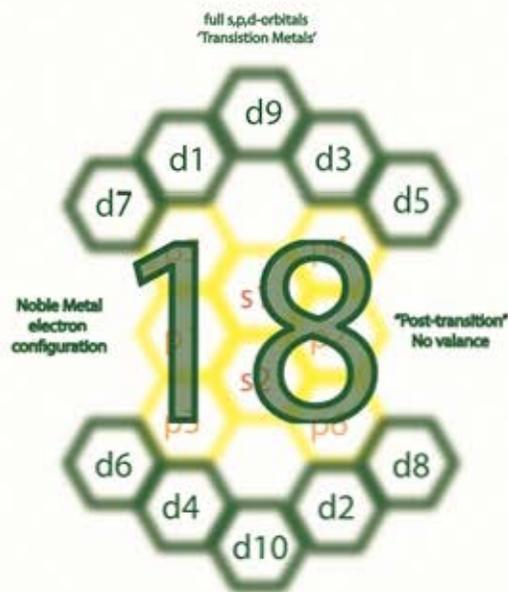
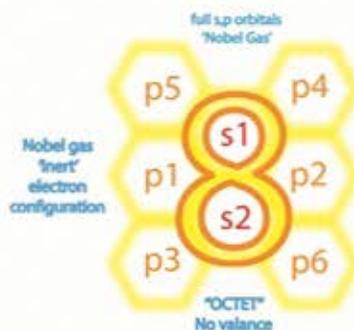
Additionally, valence numbers proceed sequentially (1,2,3,4,5,6,7) up to sub-orbit 8 (P7-8) at which point all sub-orbit valences number in valence pairs (1-2, 3-4, 5-6, 7-8, 9-10, 11-2, 13-14)

The significance is that sub-orbit 8 is the middle sub-orbit (of 16 total sub-orbits possible)

Once 8 valence electrons are reached a stable valence configuration is created

Once sub-orbit 8 (P7-8) is reached sequential valence numbering switches to paired valence numbering (as per orbital energies)

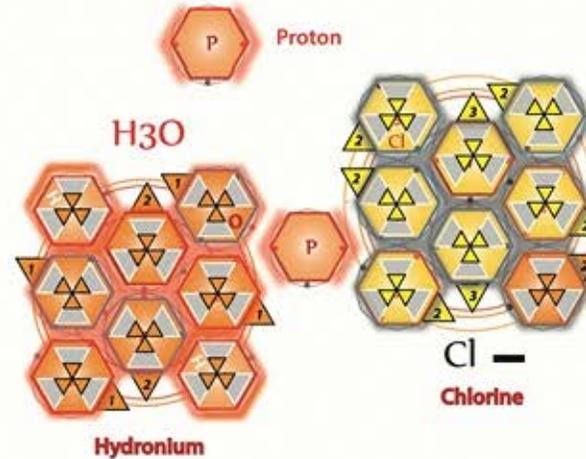
Valence numbers can be calculated by adding the 2 highest energy orbitals together (and subtracting 8 - if the total is higher than 8)



ACID

Hydrochloric acid is a clear, colourless solution of hydrogen chloride in water, it is a highly corrosive, strong mineral acid

The H(+) cation of the acid combines with the OH(-) anion of the base to form water.



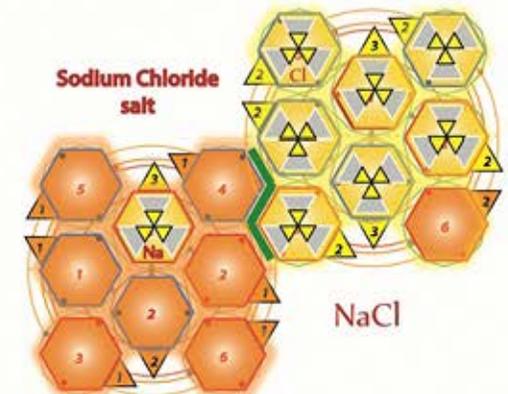
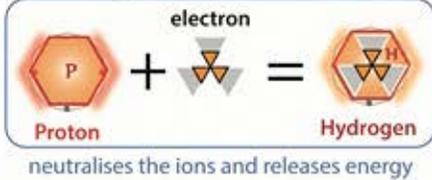
all charges seek equilibrium

+

When an acid and a base are placed together, they react to neutralize the acid and base properties, producing a salt.



⇒



The compound formed by the cation of the base and the anion of the acid is called a salt.

BASE

Sodium hydroxide, also known as caustic soda, or lye, has the molecular formula NaOH and is a highly caustic metallic base and alkali salt.

Geometric Molecular Topology

Hydrogen



A Hydrogen bond is a chemical bond in which a hydrogen atom of one molecule is attracted to an electronegative atom, especially nitrogen, oxygen, or fluorine atoms, usually of another molecule

The hydrogen bond is often described as an electrostatic dipole-dipole interaction.

However, it also has some features of covalent bonding: it is directional and strong, acting over interatomic distances shorter than that of van der Waals radii

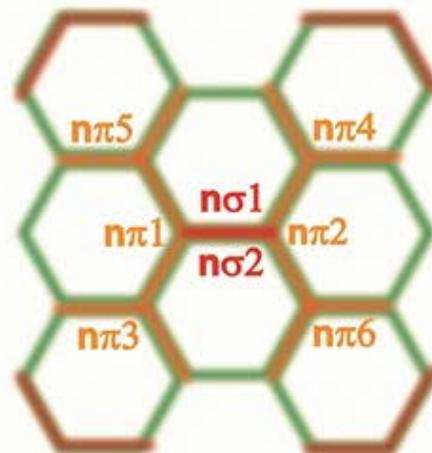
All molecules seek KEM'ical charge and energy equilibrium

Common nitrogen functional groups include: amines, amides, nitro groups, imines, and enamines.



Nitrogen

Molecules are most often held together with covalent bonds involving single, double, and/or triple bonds, where a "bond" is a pair of electrons shared between elements as they seek equilibrium (another method of bonding is ionic bonding and involves a positive cation and a negative anion).



Geometric Molecular Topology is the overall arrangement of the atoms in a molecule, where the bonded atoms in a molecule are responsible for determining the final molecular topology of a chemical system of bonded elements.

As the numbers of atoms in molecules increases, the quantum molecular topology of a system grows increasingly complex and can only be modelled accurately using Tetrayonic charged geometries

Molecular Octets

The concept of the Expanded Octet occurs in any system that has an atom with more than four electron pairs attached to it.

Most commonly, atoms will expand their octets to contain a total of five or six electron pairs, in total. In theory, it is possible to expand beyond those number.

The large amounts of negative charge concentrated in small volumes of space prevent those larger expanded octets from forming.

When an atom expands its octet, it does so by making use of empty d-orbitals that are available in the valence level of the atom doing the expanding.

The atom that expands its octet in a structure will usually be located in the center of the structure and the system will not use any multiple bonds in attaching atoms to the central atom.



The oxidation state of oxygen is -2 in almost all known compounds

Oxides of Oxygen & oxygen molecules are found throughout the range of Organic & inorganic compounds

by bonding together and forming larger complex molecules

Compounds of Carbon form the 'backbones' of Organic & inorganic compounds

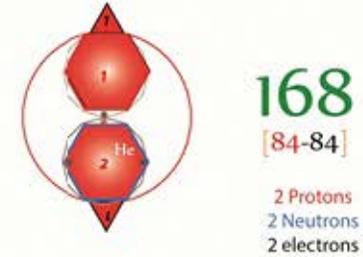
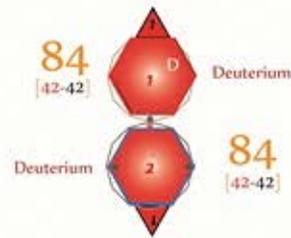
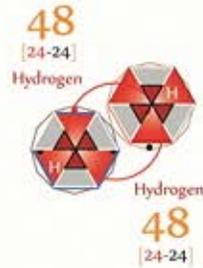


Carbon

48
[24-24]

96
[48-48]

1 Proton
1 electron

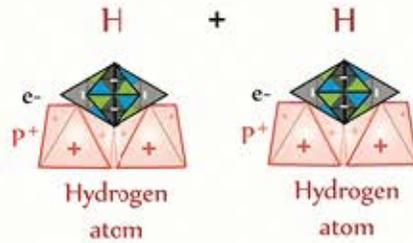


bonds

Hydrogen is a
'free radical' atom

H2 has a smaller s-orbital
[lower energy level]
compared to Helium

Deuterium is the
building block of elements

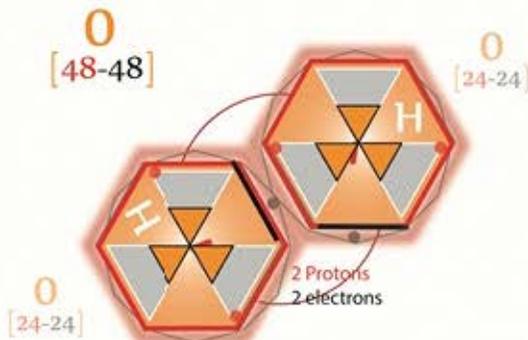


Hydrogen atoms
form Covalent bonds



Hydrogen, bound mostly to carbon and nitrogen, is part of almost every molecule in your body: DNA, proteins, sugars, fats. Hydrogen bonds - which form between atoms that "share" a hydrogen atom, is one of the most important interactions that makes biological molecules behave as they do.

Hydrogen



Hydrogen bonds are sigma bonds



note: n2 energy level Hydrogen is illustrative only
(Hydrogen bonds can be of any energy level)

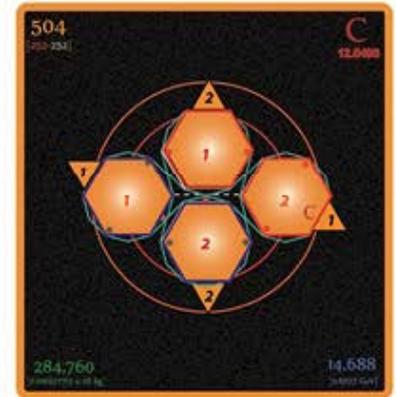
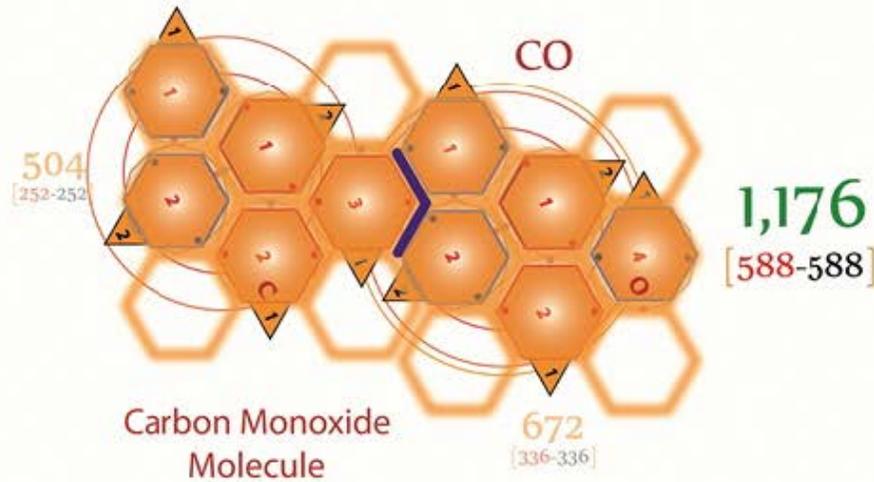


H

The charged fascia of Baryonic quarks facilitates
chemical [hydrogen] bonding in molecules

504
[252-252]

Carbon can bond in four places, and it can bond to itself so it's easy to make lots of different molecules.

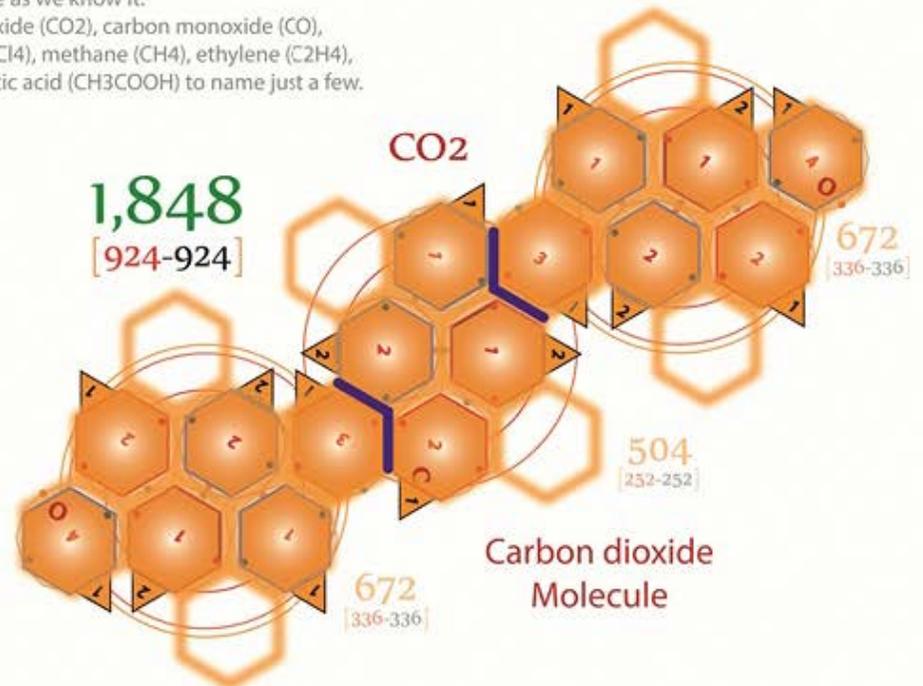
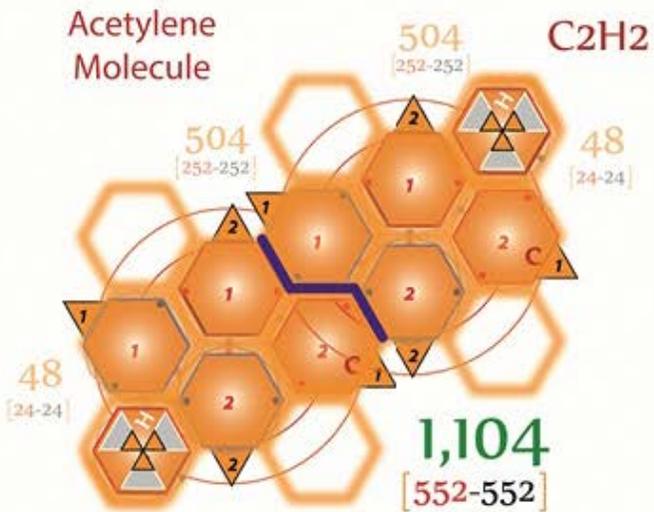


[He] 2s² 2p²

Carbon Compounds

Many carbon compounds are essential for life as we know it.

Some of the most common carbon compounds are: carbon dioxide (CO₂), carbon monoxide (CO), carbon disulfide (CS₂), chloroform (CHCl₃), carbon tetrachloride (CCl₄), methane (CH₄), ethylene (C₂H₄), acetylene (C₂H₂), benzene (C₆H₆), ethyl alcohol (C₂H₅OH) and acetic acid (CH₃COOH) to name just a few.

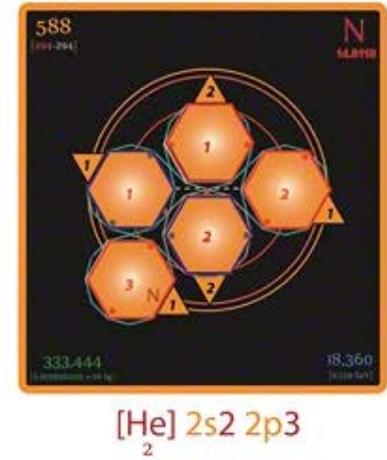
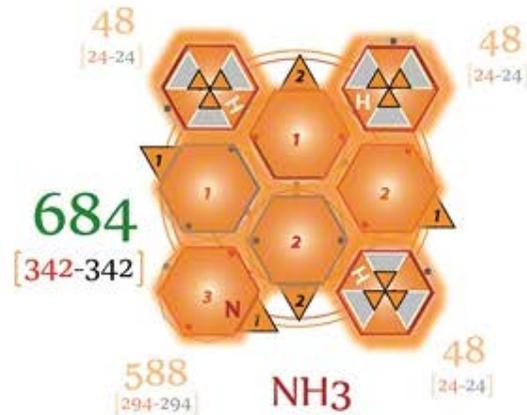
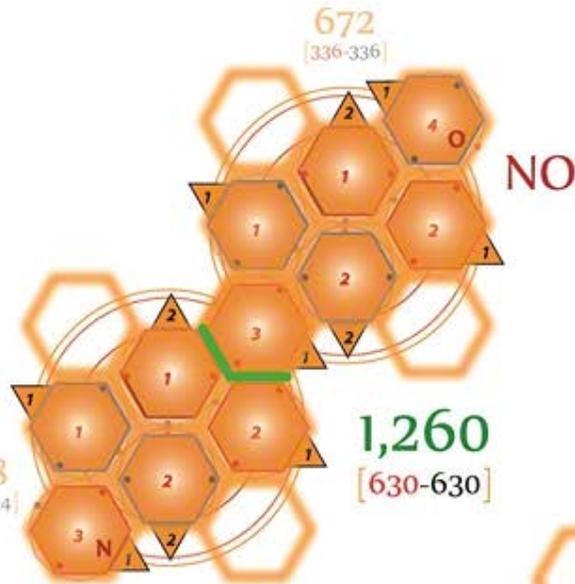


There are nearly ten million known carbon compounds and an entire branch of chemistry, known as organic chemistry, is devoted to their study.

C

Nitrogen Compounds

588
[294-294]

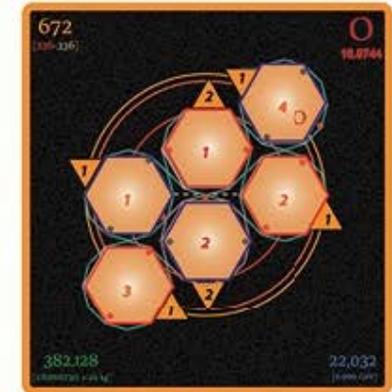
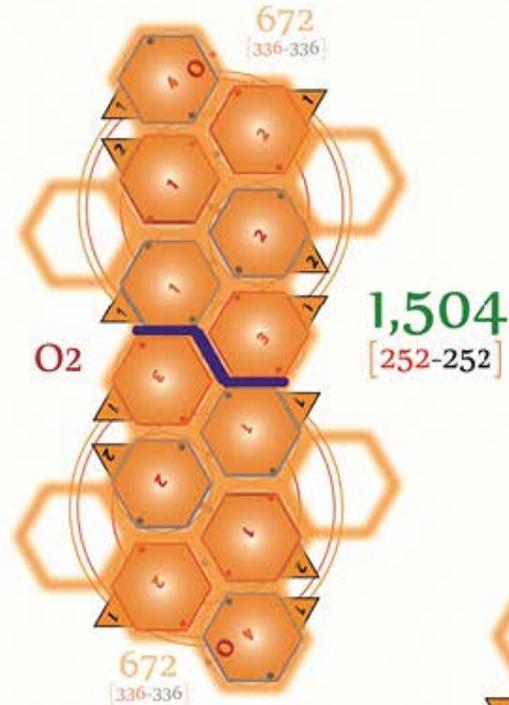


672

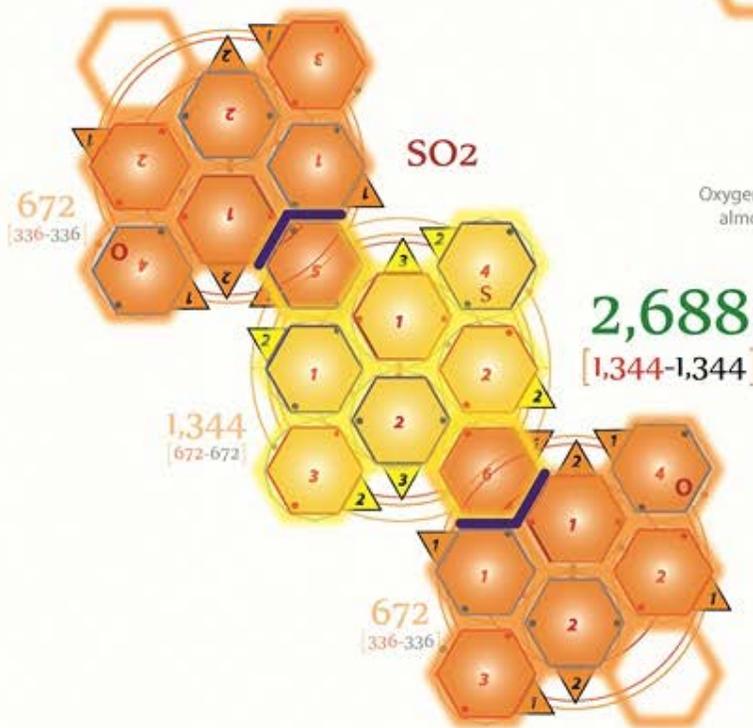
[336-336]

Oxygen Compounds

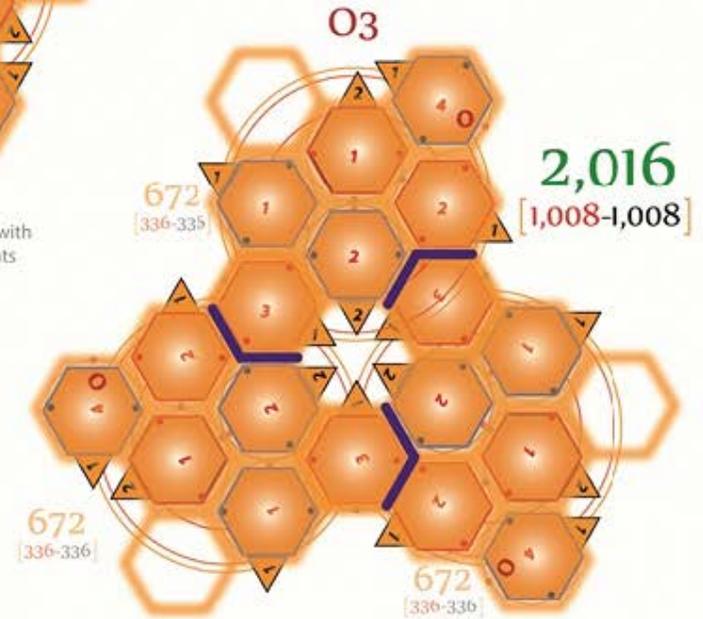
O



[He] 2s² 2p⁴₂

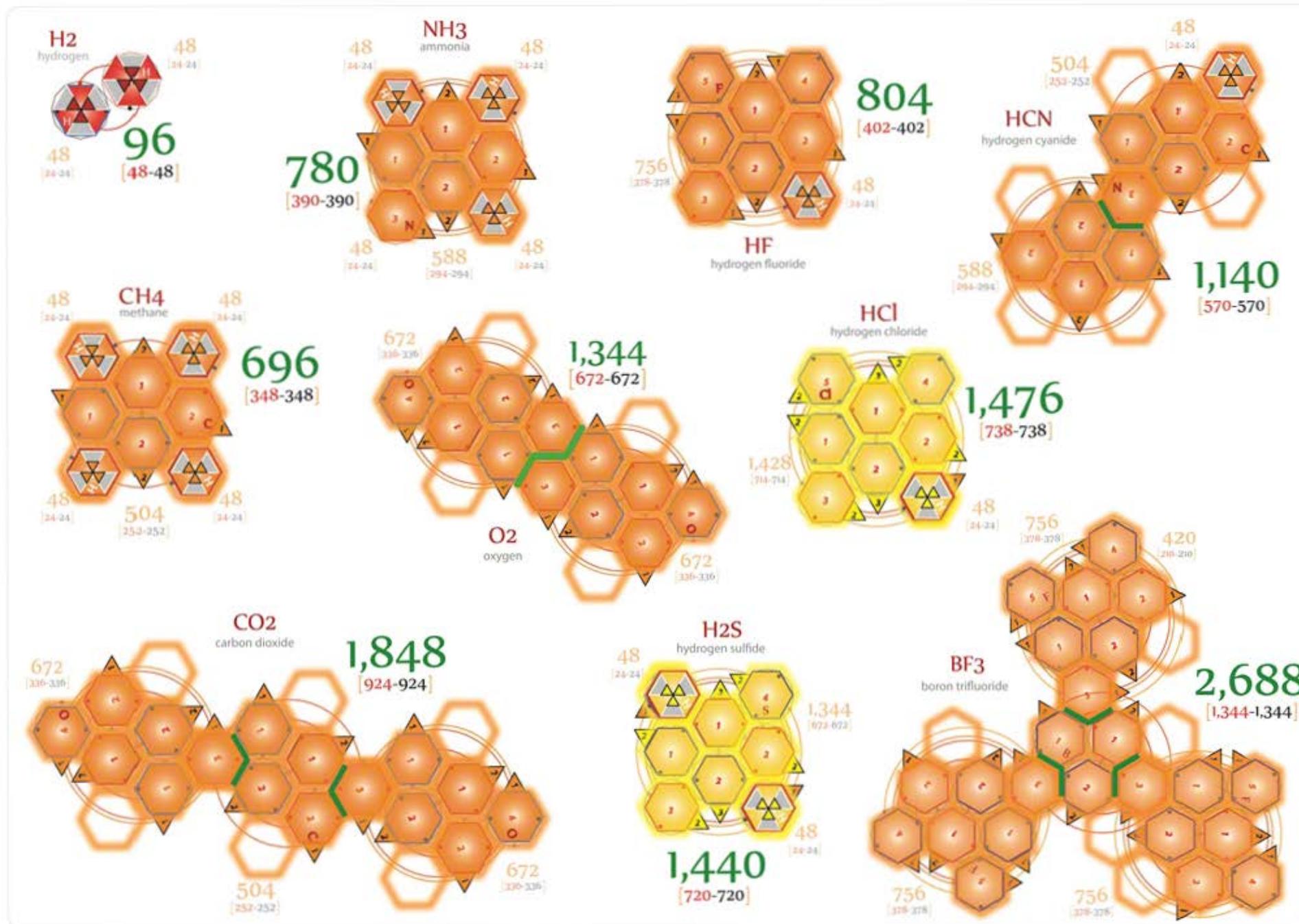


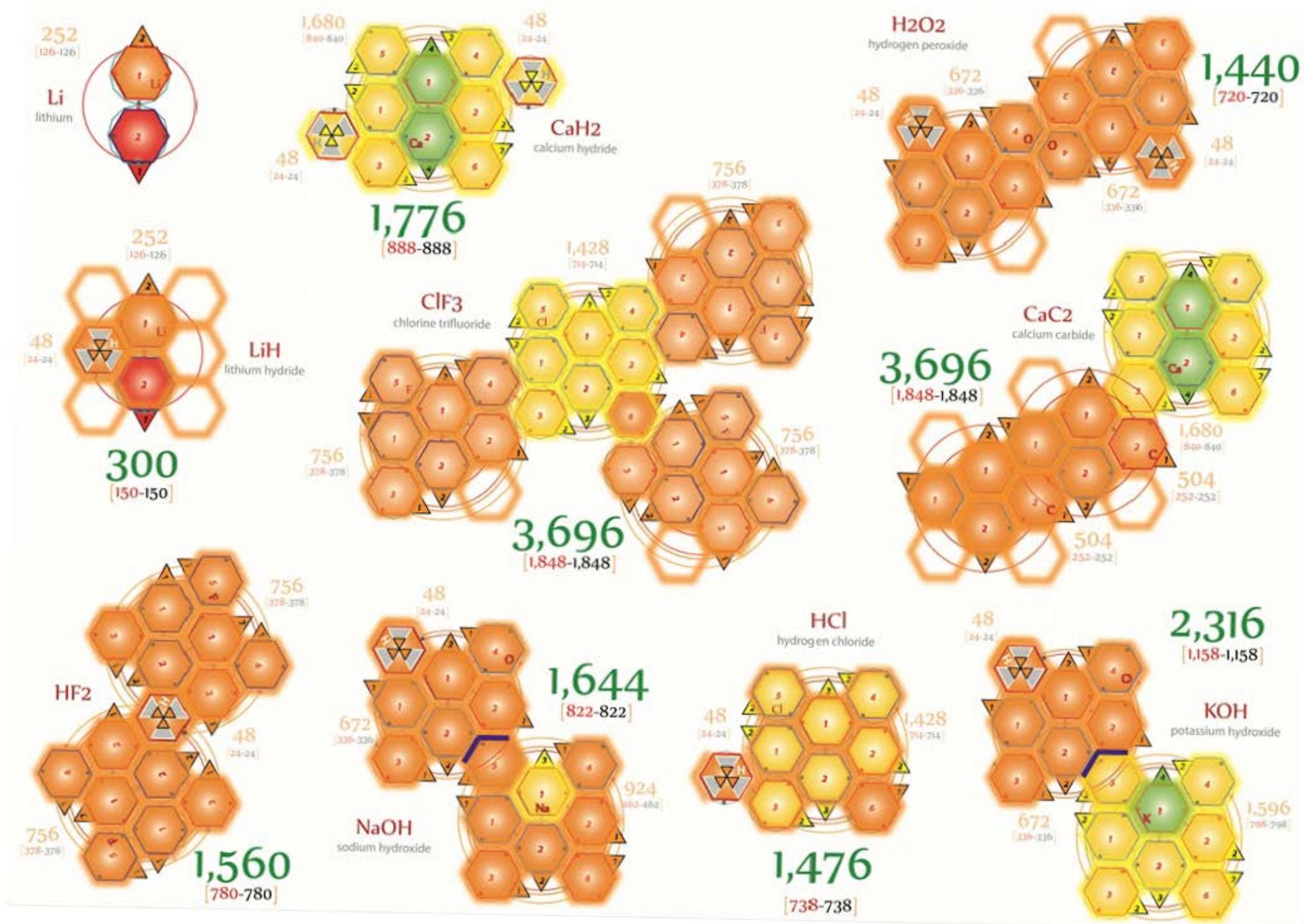
Oxygen forms oxide compounds with almost all of the known elements



As soon as the oxygen enters your blood, a passing protein molecule called hemoglobin picks it up. Each molecule of hemoglobin can transport four molecules of oxygen to almost anywhere in the body.

The hemoglobin transport the oxygen to your cells where another protein, called cytochrome C oxidase makes two molecules of water out of every molecules of oxygen delivered to it

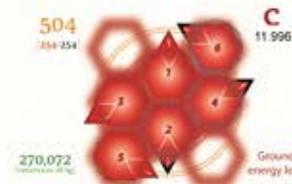
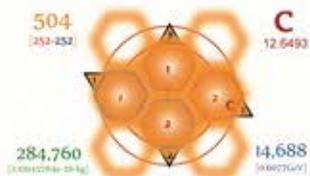




Chemistry

is a branch of physical science, concerning the study of the composition, properties and behavior of Matter

Compounds containing bonds between carbon and a metal are called organometallic compounds.



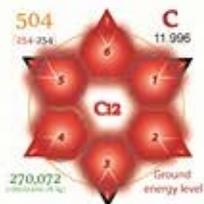
Inorganic compounds are produced by non-living natural processes or in the laboratory.



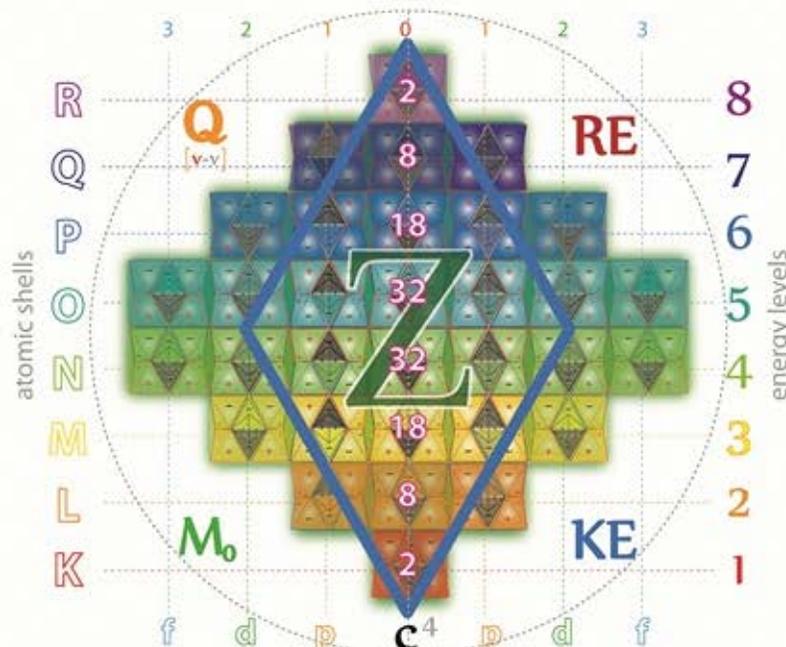
Inorganic compounds can form salts.



Inorganic compounds contain metal atoms.



Schrodinger's quantum numbers



Bohr's atomic orbitals

Organic compounds are produced by living things.



Organic compounds can't form salts.



Organic compounds contain carbon-hydrogen bonds.

Tetryonic theory unifies and expands upon the currently disjointed physical and chemical theories through the application of 2D equilateral charged mass-energy geometries in 3D standing-wave mass-Matter topologies

Inorganic

Typically the difference is defined as being whether or not a substance contains carbon or carbon-hydrogen bonds

Organic

A chemical compound is a collection of elements bonded together in a way that the resultant ions, atoms or molecules form a 3D material geometric structure.

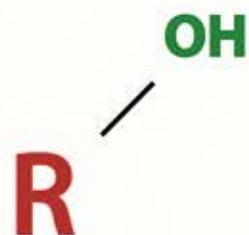
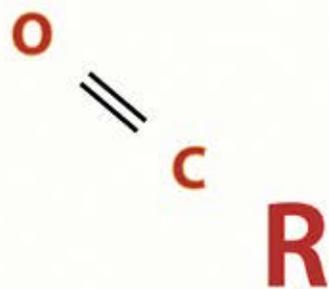
Tetryonic chemical geometries, along with its firm definition and distinction between EM mass & Matter provide a clear visual path for the differentiation between both branches of modern chemistry - as well as the source of animation in living Matter



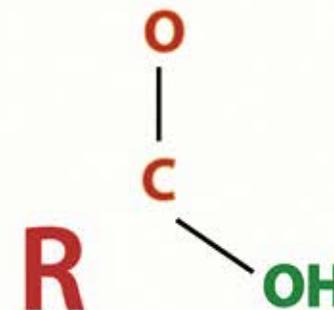
Functional Groups

A functional group is a reactive portion of a molecule.

carbonyl group



carboxyl group

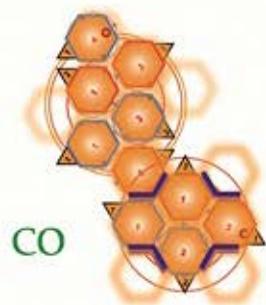


hydroxyl group

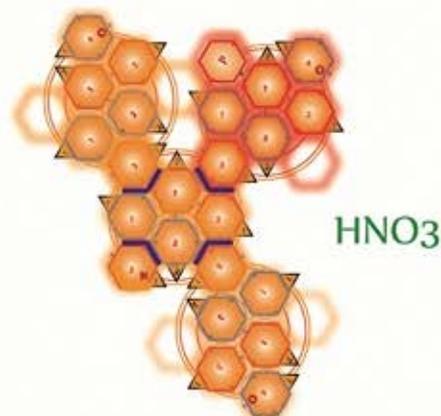
Organic molecules containing a hydroxyl group are known as alcohols.

The combinations of functional groups with hydrocarbons produce a vast number of compounds.

Carbon monoxide

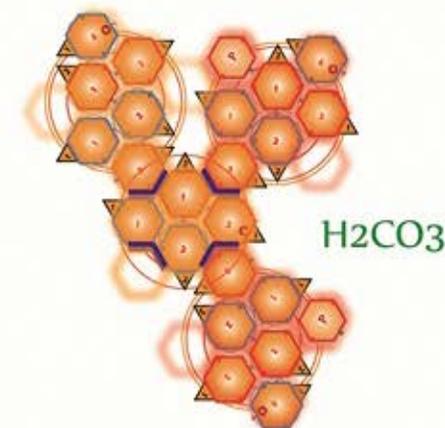


carbonyl group is composed of a carbon atom double-bonded to an oxygen atom



Nitric acid

Carbonic acid

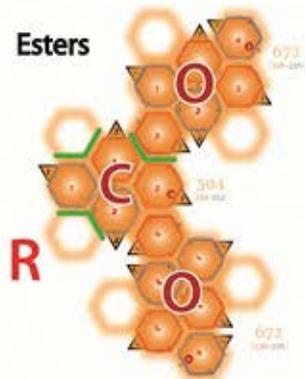


The carboxyl group is present in amino acids and carboxylic acids.

Derivatives of Hydrocarbons

An almost unlimited number of carbon compounds can be formed by the addition of a functional group to a hydrocarbon

Esters



Most esters have pleasant odors. Esters are responsible for the fragrances of many flowers & the tastes of ripened fruits.



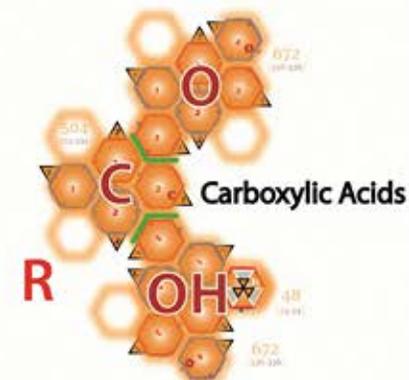
Ethers

The best known ether is diethyl ether. It is a volatile, highly flammable liquid that was used as an anesthetic in the past.



Alkyl Halides - haloalkanes

Common alkyl halides include medical anesthetics, chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs) and hydrofluorocarbons (HFCs).



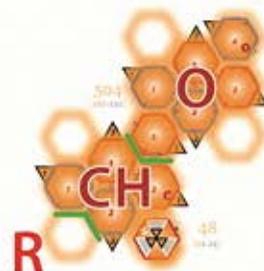
Carboxylic Acids

The simplest of the carboxylic acids is formic acid and is a constituent of bee stings and the bites of other insects including mosquitos.



Alcohols

Alcohols are organic compounds containing a hydroxyl group, [OH], substituted for a hydrogen atom. Ethanol is the alcohol in alcoholic beverages and it is also widely used as a solvent.



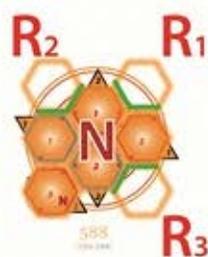
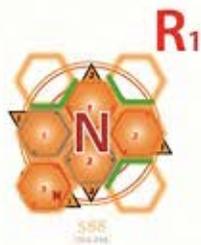
Aldehydes

An aldehyde is a compound containing a carbonyl group with at least one hydrogen attached to it. With a Hydrogen in place of the R group it forms Formaldehyde



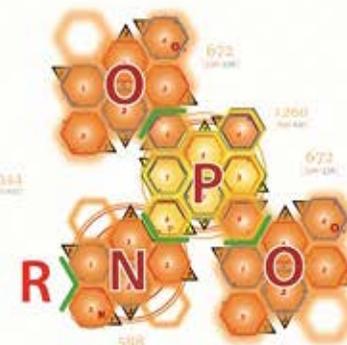
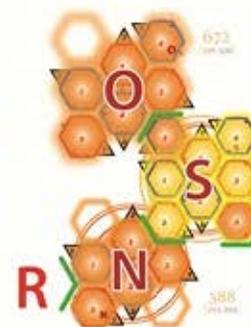
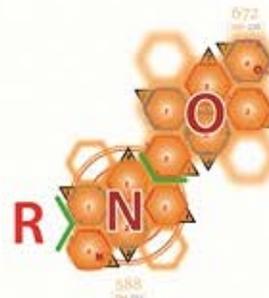
Ketones

Acetone is the simplest of the ketones. Acetone is a commonly used solvent and is the active ingredient in nail polish remover and some paint thinners.



Amines

Amines are organic compounds that contain nitrogen, they are basic compounds with strong odors, often described as "fishy"



Amides

Amides are nitrogen-containing organic compounds and are formed when amino acids react to form proteins.

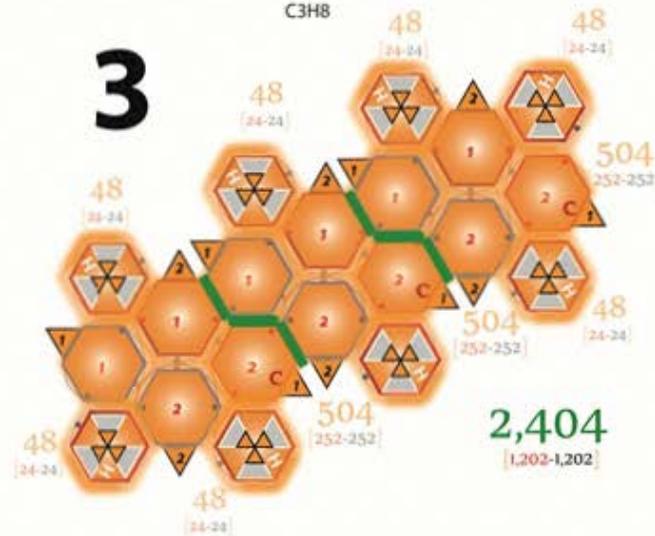
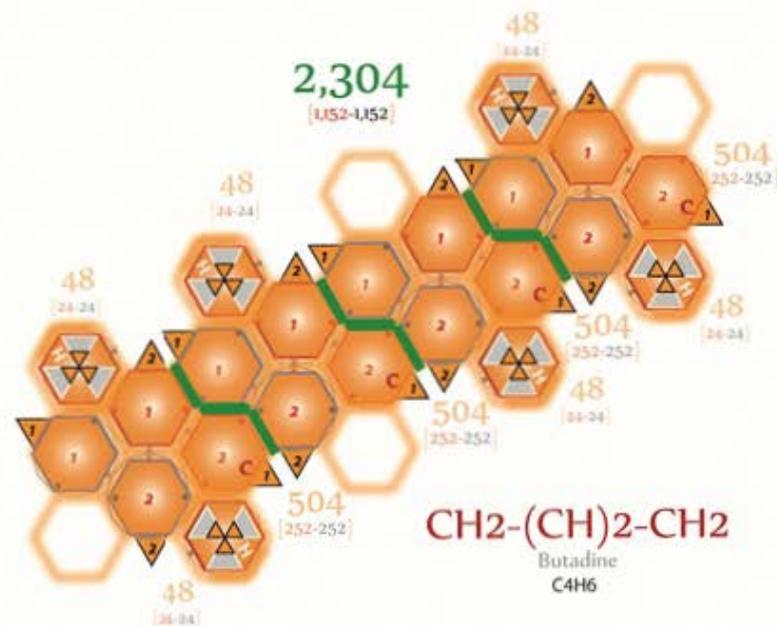
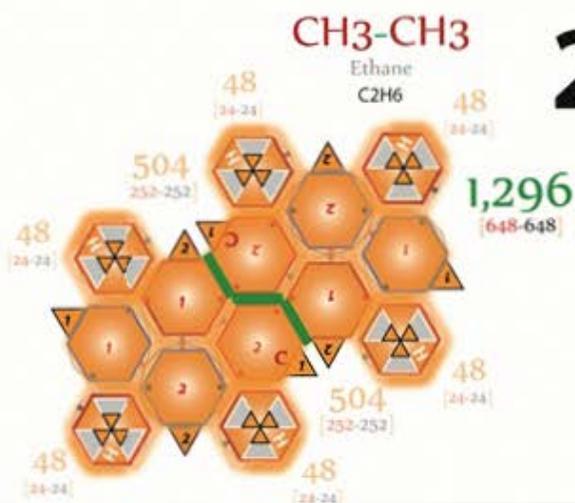
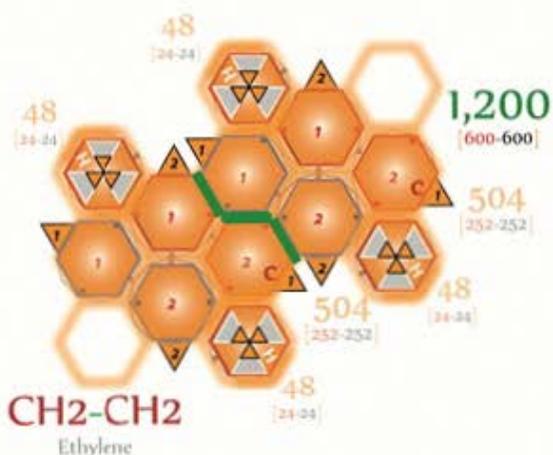
"R's" stand for carbon substituents or hydrogen atoms.

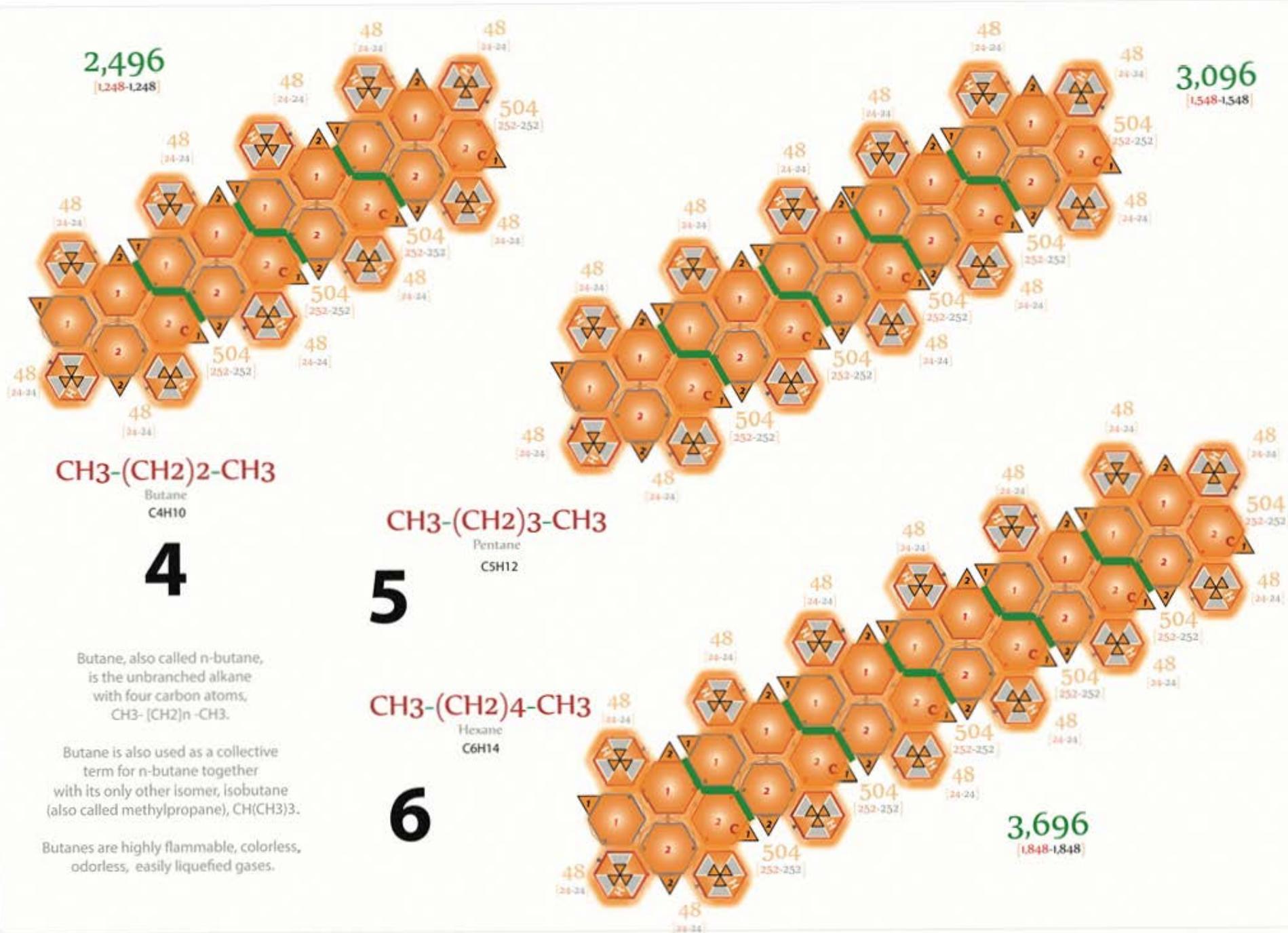
Hydrocarbons

In organic chemistry, a methylene group is any part of a molecule that consists of two hydrogen atoms bound to a carbon atom, which is connected to the remainder of the molecule.

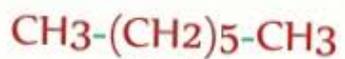


The methylene group should be distinguished from the free methylene radical, also called carbene, whose molecule is a methylene group all by itself.



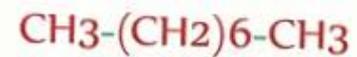
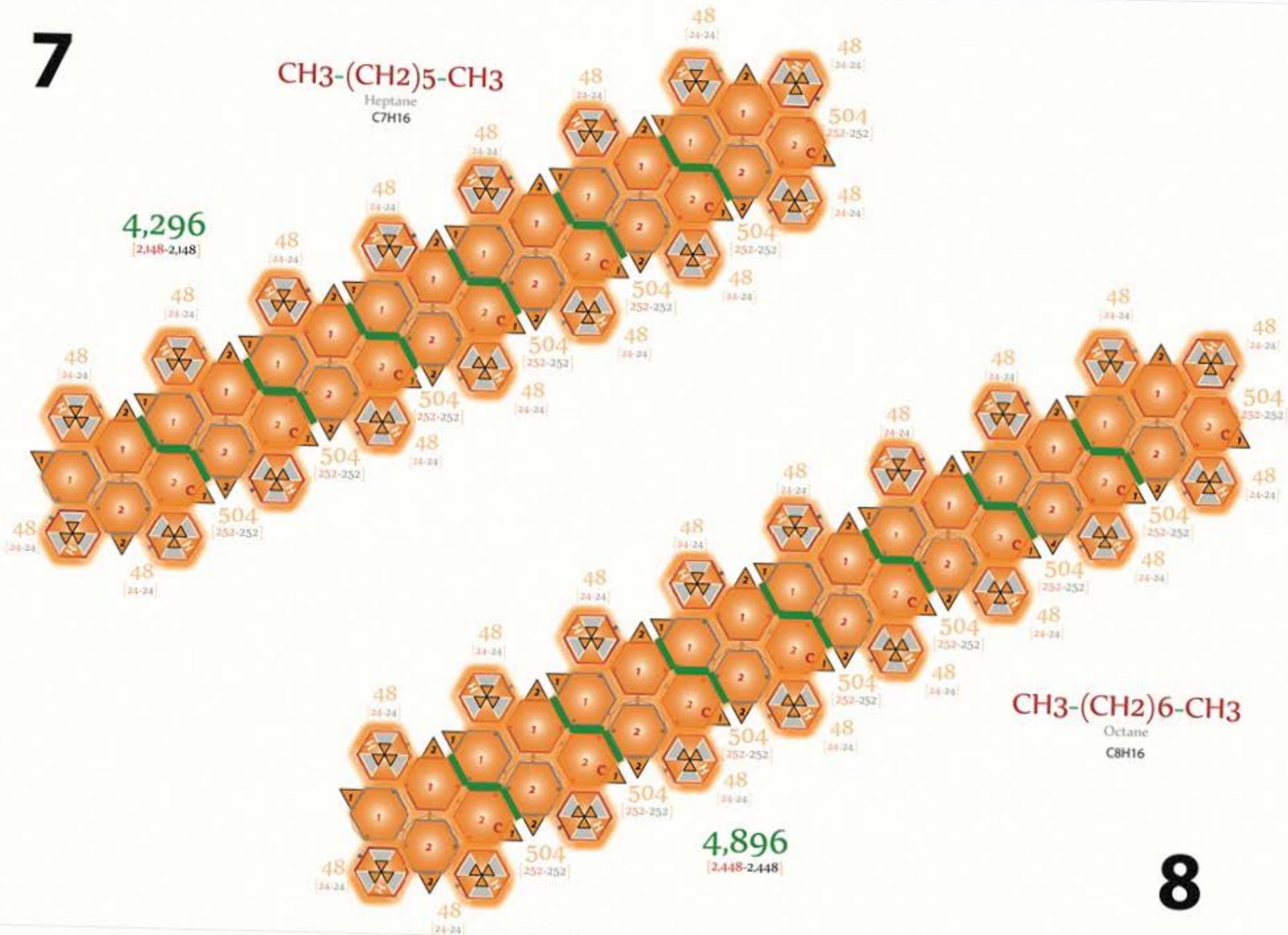


7



Heptane
C₇H₁₆

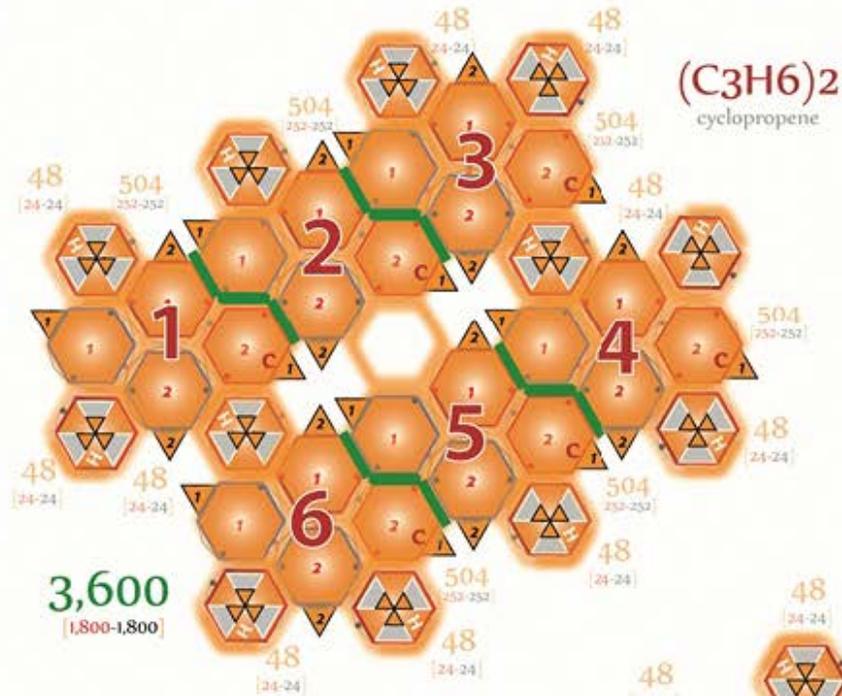
4,296
[2,148-2,148]



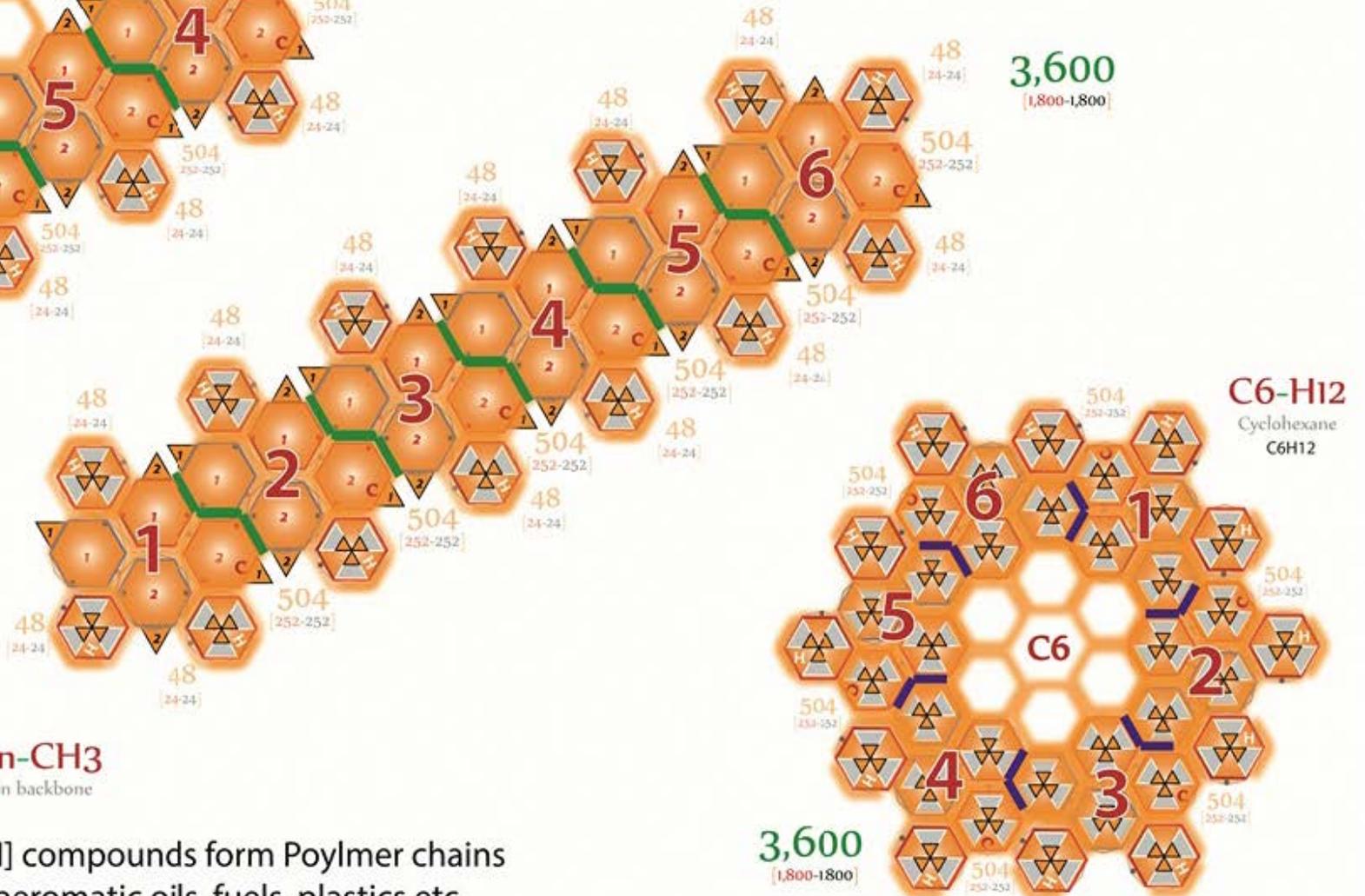
Octane
C₈H₁₆

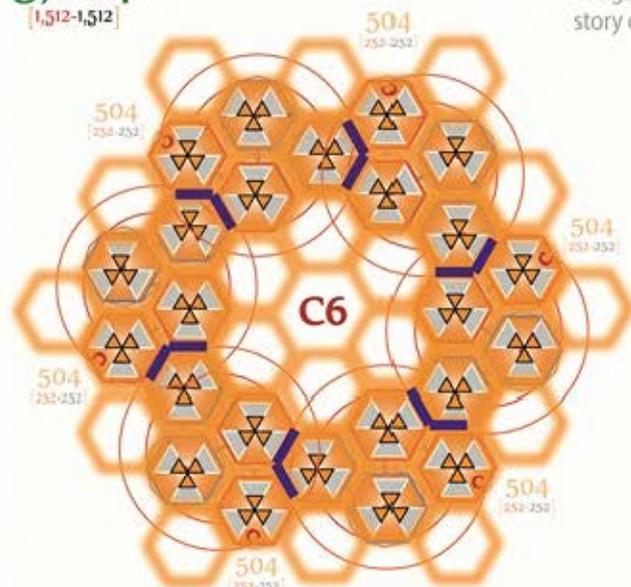
4,896
[2,448-2,448]

8



Just like periodic elements,
compounds can form
allotropic compound structures



3,024
[1,512-1,512]

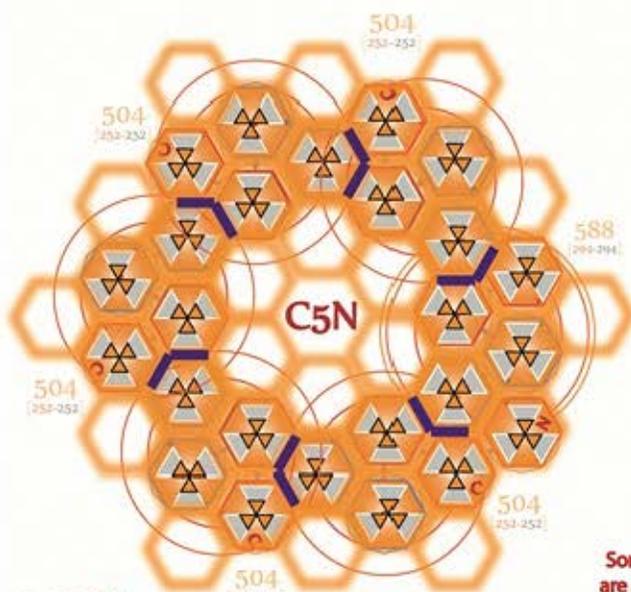
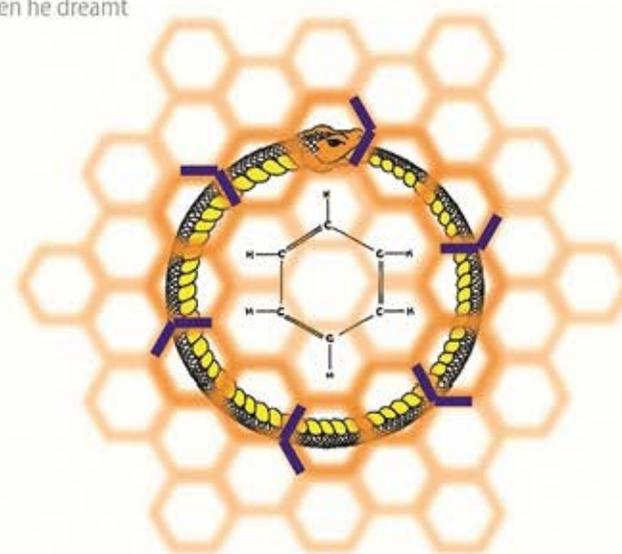
Carbon ring

Rings of atoms are also common in organic structures. You may have heard the famous story of Auguste Kekulé first realizing that benzene has a ring structure when he dreamt of snakes biting their own tails.

Friedrich August Kekulé



(7 September 1829 - 13 July 1896)

3,108
[1,554-1,554]

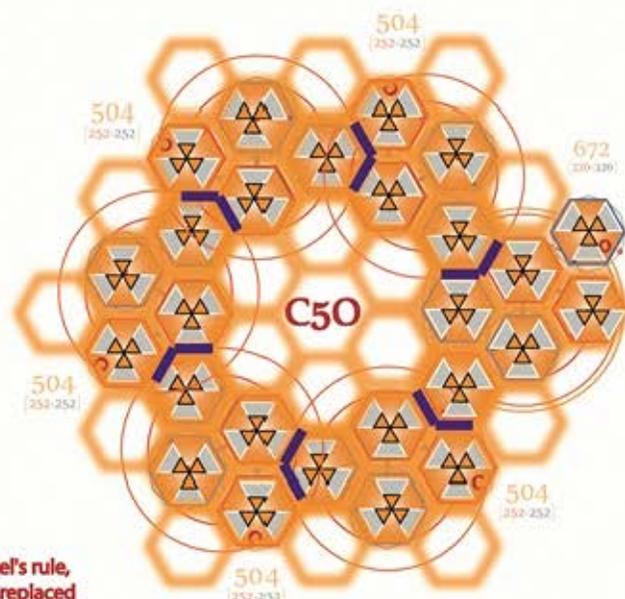
Carbon-Nitrogen ring

Organic Chemistry

In 1865, August Kekulé presented a paper at the Academie des Sciences in Paris suggesting a cyclic structure for benzene, the inspiration for which he ascribed to a dream. However, was Kekulé the first to suggest that benzene was cyclic. Some credit an Austrian schoolteacher, Josef Loschmidt with the first depiction of cyclic benzene structures.

In 1861, 4 years before Kekulé's dream, Loschmidt published a book in which he represented benzene as a set of rings. It is not certain whether Loschmidt or Kekulé—or even a Scot named Archibald Couper—got it right first

Some non-benzene-based compounds called heteroarenes, which follow Hückel's rule, are also aromatic compounds. In these compounds, at least one carbon atom is replaced by one of the heteroatoms oxygen, nitrogen, or sulfur.



Carbon-Oxygen ring

3,192
[1,596-1,596]

Benzene molecules

Benzene, or benzol, is an organic chemical compound and a known carcinogen with the molecular formula C₆H₆.

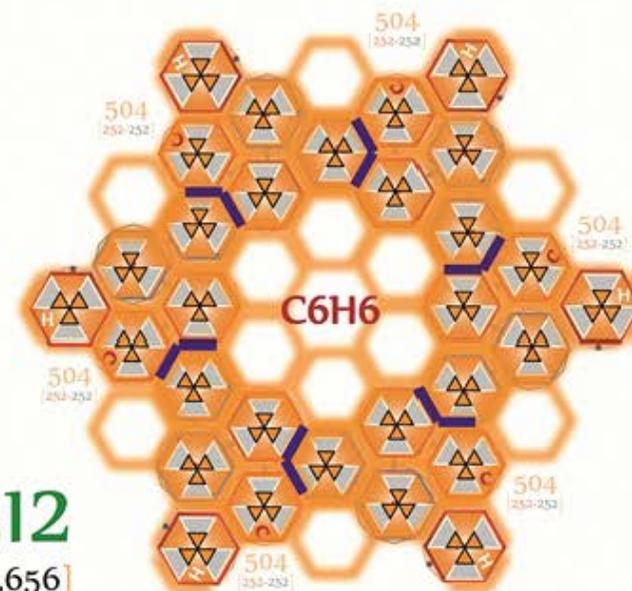
It is sometimes abbreviated Ph-H.

Benzene is a colorless and highly flammable liquid with a sweet smell and a relatively high melting point.

Because it is a known carcinogen, its use as an additive in gasoline is now limited, but it is an important industrial solvent and precursor in the production of drugs, plastics, synthetic rubber, and dyes. Benzene is a natural constituent of crude oil, and may be synthesized from other compounds present in petroleum.

Benzene is an aromatic hydrocarbon and the second [n]-annulene ([6]-annulene), a cyclic hydrocarbon with a continuous pi bond.

Cyclic hydrocarbon compounds are often referred to as Aromatic compounds due to their sweet smell

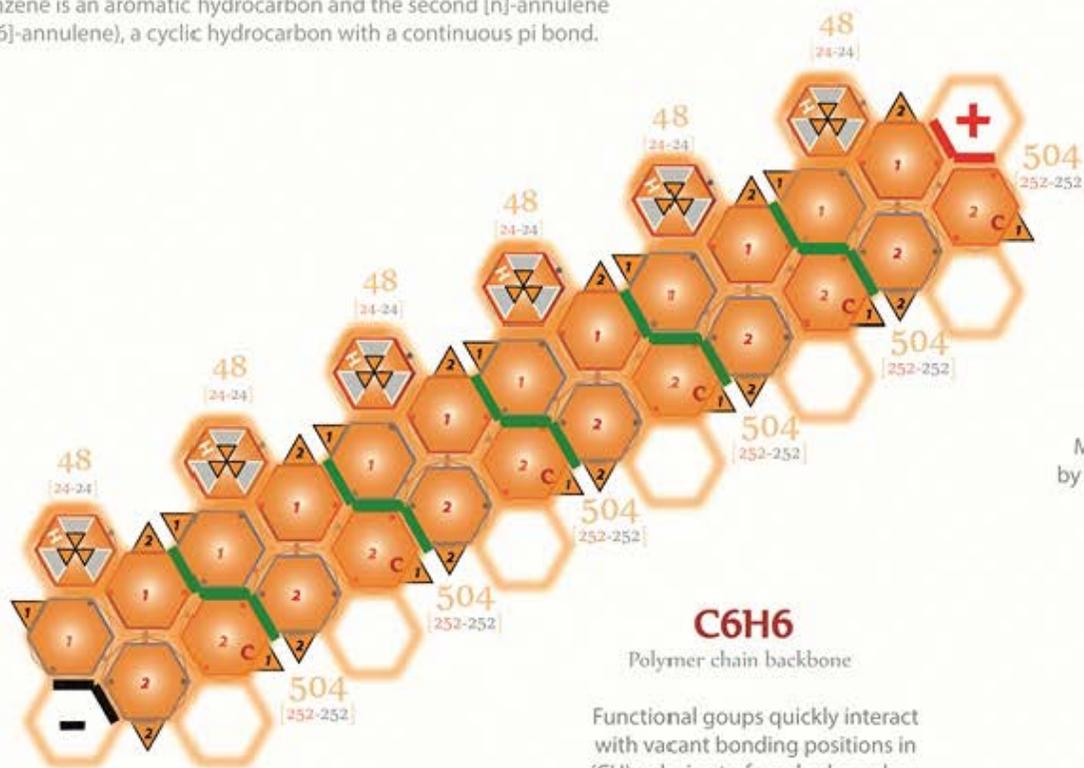


A aromatic hydrocarbon is formed when CH compounds form a cyclic molecule

Many important additional chemical compounds are derived from benzene by replacing one or more of its hydrogen atoms with another functional group.

Examples of simple benzene derivatives are phenol, toluene, and aniline, abbreviated PhOH, PhMe, and PhNH₂, respectively

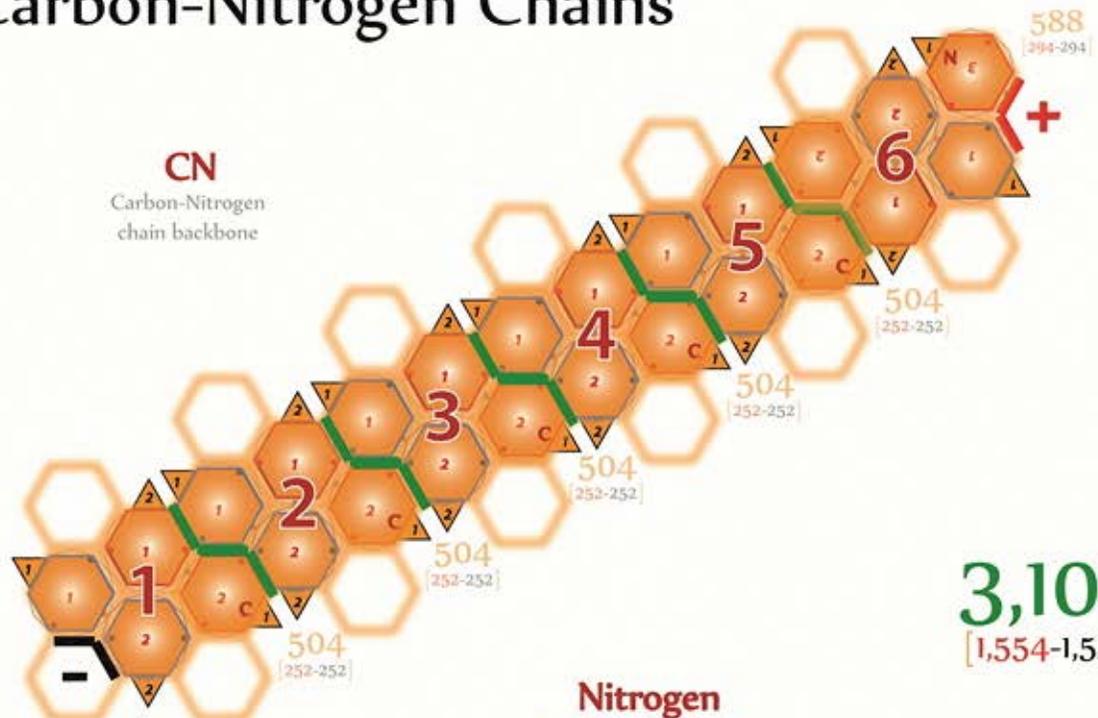
Linear (CH)_n chains are rarely found in nature as the Positive and Negative tail ends of Hydrocarbon chain interact and bond to form cyclic compounds.



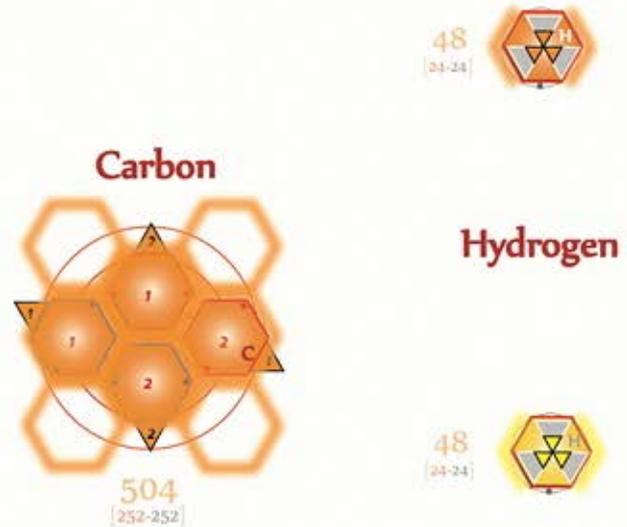
Polymer chain backbone

Functional groups quickly interact with vacant bonding positions in (CH)_n chains to form hydrocarbon compounds

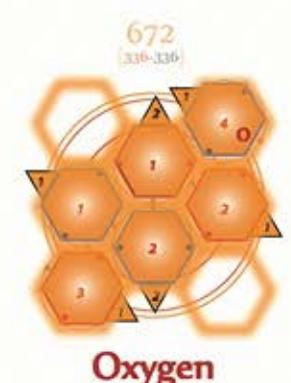
Carbon-Nitrogen Chains



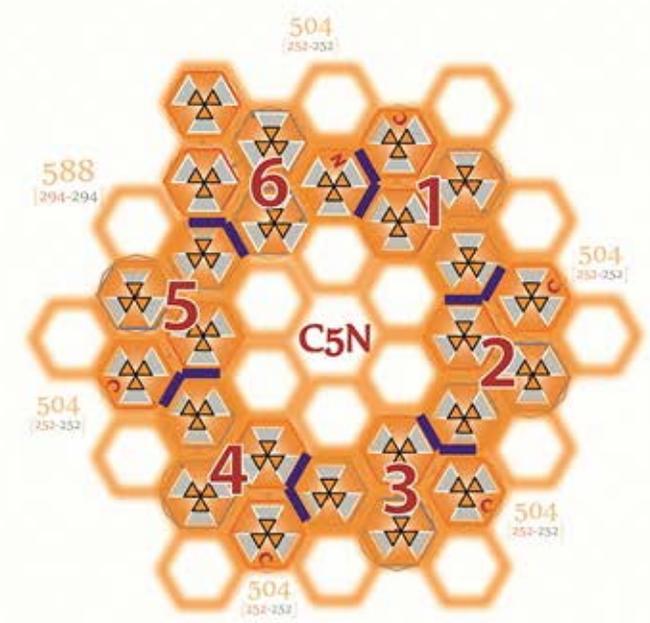
CN
Carbon-Nitrogen
chain backbone



3,108
[1,554-1,554]



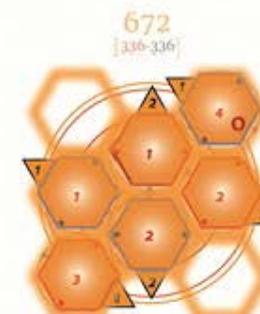
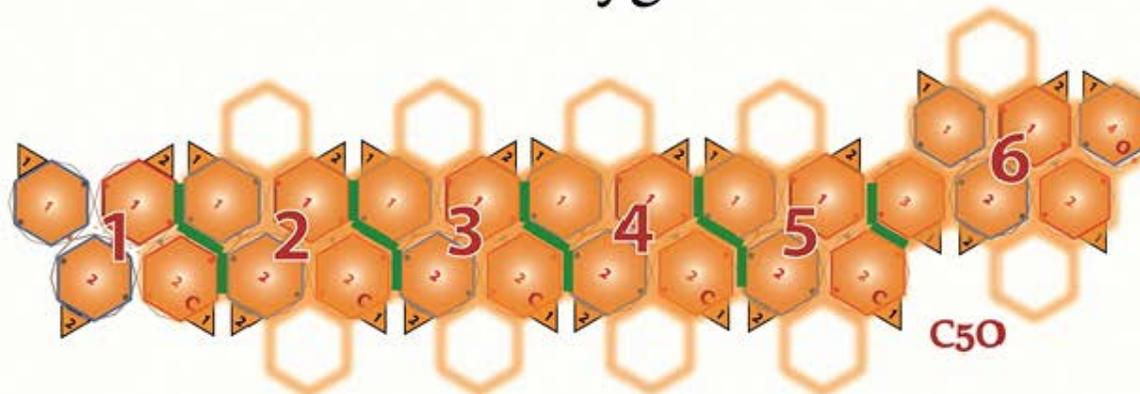
37 Protons
37 electrons
37 Neutrons



Carbon-Oxygen Chains



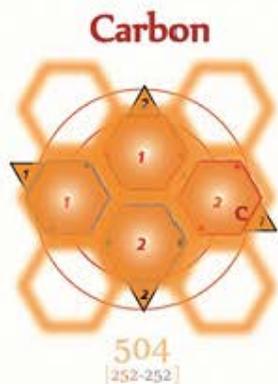
Hydrogen



Oxygen

Heterocyclic Rings

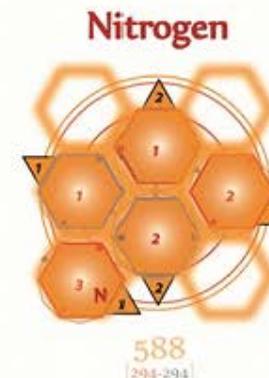
Tetrahydropyran is the organic compound consisting of a saturated six-membered ring containing five carbon atoms and one oxygen atom.



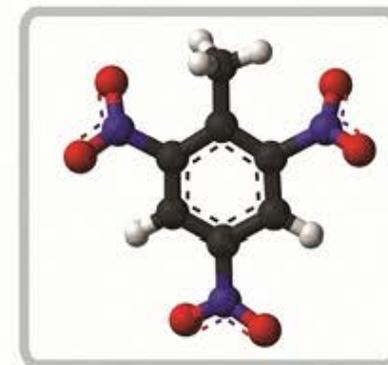
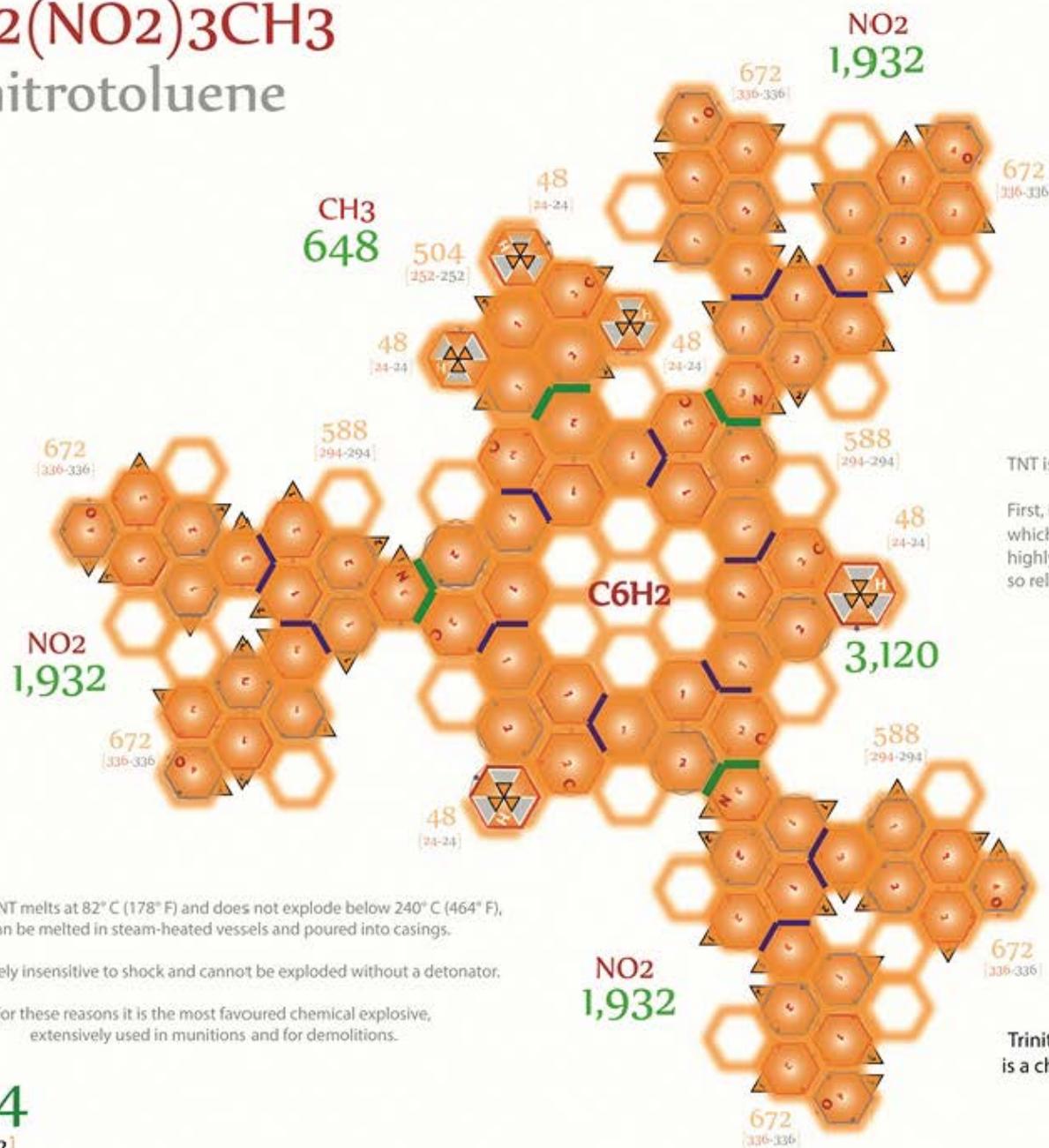
3,192
[1,596-1,596]



38 Protons
38 electrons
38 Neutrons



$C_6H_2(NO_2)_3CH_3$ Trinitrotoluene



2,4,6-trinitrotoluene is better known by its initials, TNT. It is an important explosive, since it can very quickly change from a solid into hot expanding gases.

TNT is explosive for two reasons;

First, it contains the elements carbon, oxygen and nitrogen, which means that when the material burns it produces highly stable substances (CO, CO₂ and N₂) with strong bonds, so releasing a great deal of energy.

Secondly, TNT is chemically unstable - the nitro groups are so closely packed that they experience a great deal of strain and hindrance to movement from their neighbouring groups.

Thus it doesn't take much of an initiating force to break some of the strained bonds, and the molecule then flies apart.

Because TNT melts at 82° C (178° F) and does not explode below 240° C (464° F), it can be melted in steam-heated vessels and poured into casings.

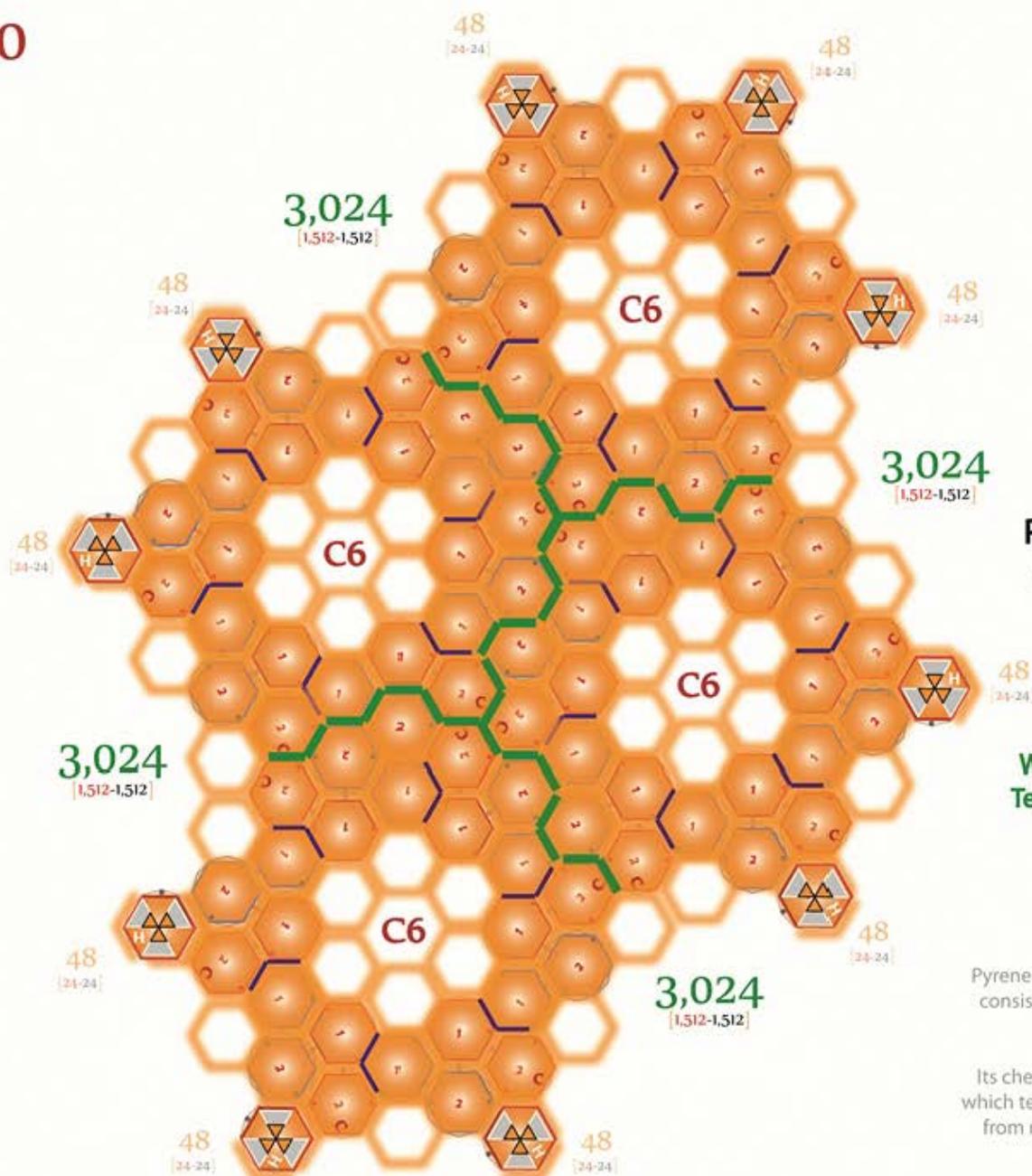
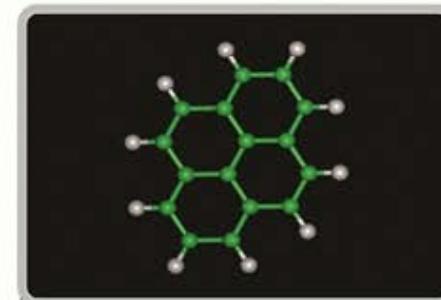
It is relatively insensitive to shock and cannot be exploded without a detonator.

For these reasons it is the most favoured chemical explosive, extensively used in munitions and for demolitions.

9,564
[4,782-4,782]

Trinitrotoluene, or more specifically, 2,4,6-trinitrotoluene, is a chemical compound with the formula $C_6H_2(NO_2)_3CH_3$

(C6)4-H10
Pyrene



12,576
 [6,288-6,288]

Pyrene highlights the failings of Lewis diagram structures

Which can be rectified using charged Tetryonic geometric Matter topologies for all elements and compound interactions & modelling

Pyrene is a polycyclic aromatic hydrocarbon (PAH) consisting of four fused benzene rings, resulting in a flat aromatic system.

Its chemical formula as is often stated as C₁₆H₁₀, which tetryonic geometry shows is an error resulting from not using equilateral quantum geometries in chemical topology modelling.

Four cyclic carbon rings cannot be formed with only 16 C-atoms

Ammonium Nitrate

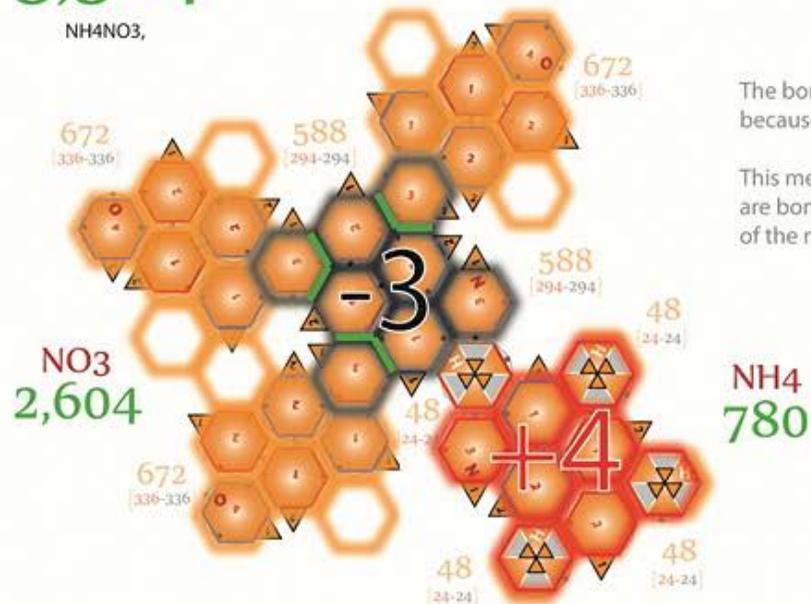
3,384

NH₄NO₃,

Ammonium nitrate is composed of two polyatomic ions:

- 1) Ammonium Ion (NH₄⁺)
- 2) Nitrate Ion (NO₃⁻)

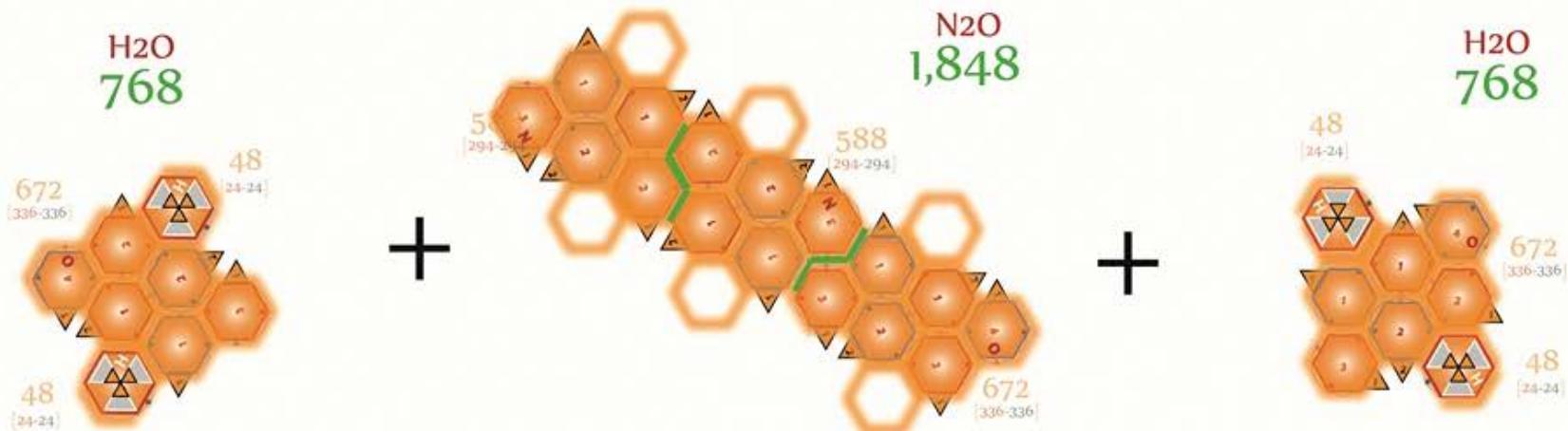
The bond between these ions is an ionic bond meaning the ammonium ion transfers an electron to the nitrate ion.



The bonds in a polyatomic atomic ion are covalent because they take place between gases.

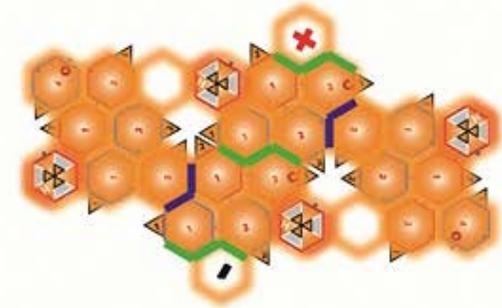
This means that the hydrogens of the ammonium ion are bonded to the nitrogen covalently and that the oxygens of the nitrate are bonded to the nitrogen covalently

Ammonium nitrate decomposes into the gases nitrous oxide and water vapor when heated (non-explosive reaction); however, ammonium nitrate can be induced to decompose explosively by detonation.



Carbohydrates

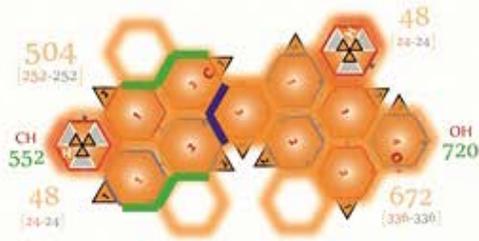
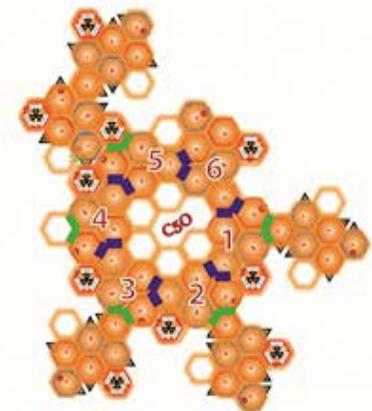
A carbohydrate is an organic compound that consists only of carbon, hydrogen, and oxygen (with a hydrogen:oxygen ratio of 2:1) in other words, with the empirical formula $C_m(H_2O)_n$



Disaccharides



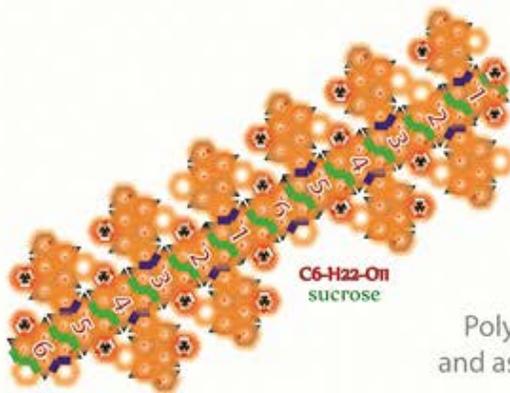
Polysaccharides



Monosaccharides



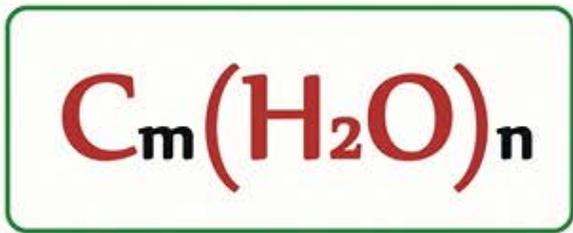
Oligosaccharides



Ribose

Glucose

Lactose



Fructose

Sucrose

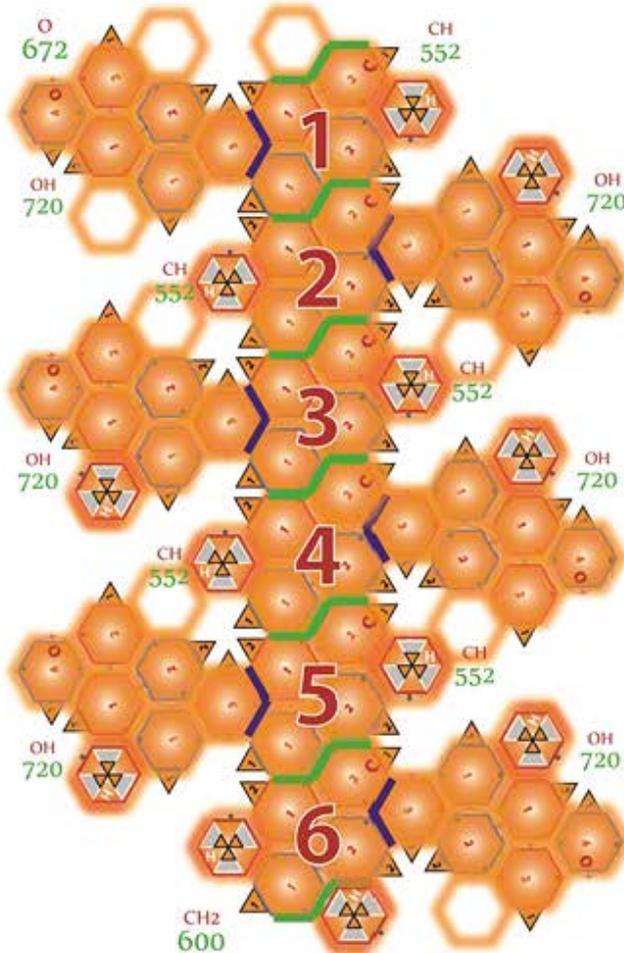
Deoxyribose

Carbohydrates perform numerous roles in living organisms. Polysaccharides serve for the storage of energy (e.g., starch and glycogen), and as structural components (e.g., cellulose in plants and chitin in arthropods)

Monosaccharides are the simplest carbohydrates in that they cannot be hydrolyzed to smaller carbohydrates

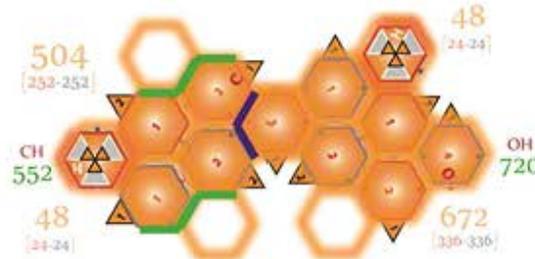
Monosaccharides

The Carbon nuclei in Monosaccharides join together to form chains of biologically important carbohydrates



C(H₂O)₆
D-glucose
 C₆-H₁₂-O₆

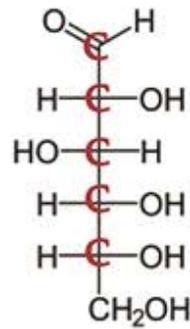
1,272
[636-636]



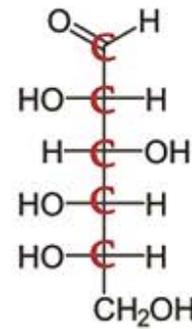
C(H₂O)

The general chemical formula of an unmodified monosaccharide is (C·H₂O)_n, literally a "carbon hydrate."

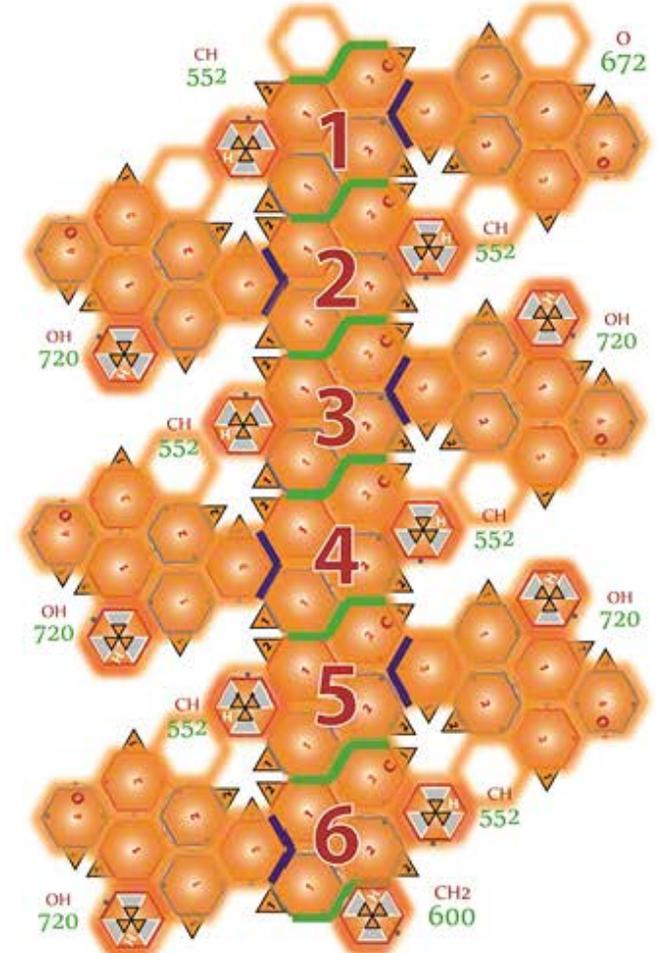
CH 552 **CH-OH** OH 720



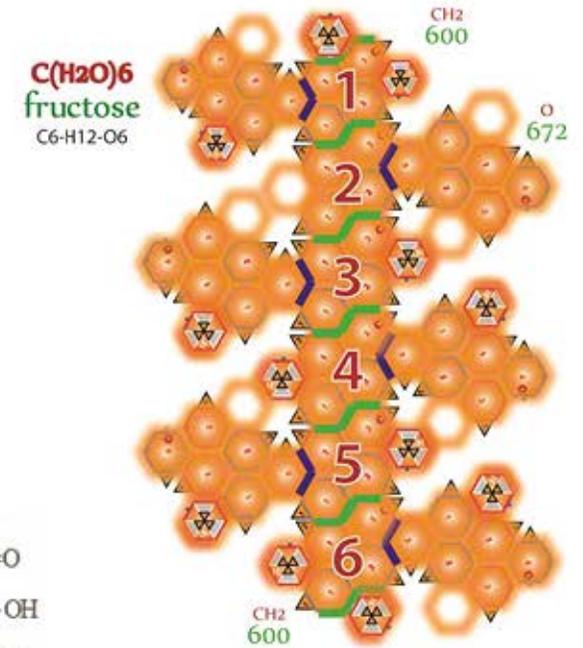
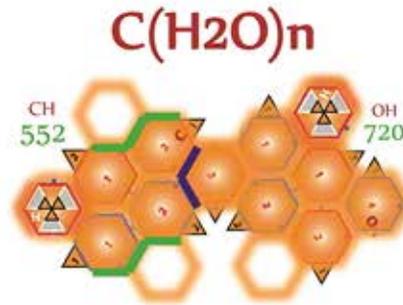
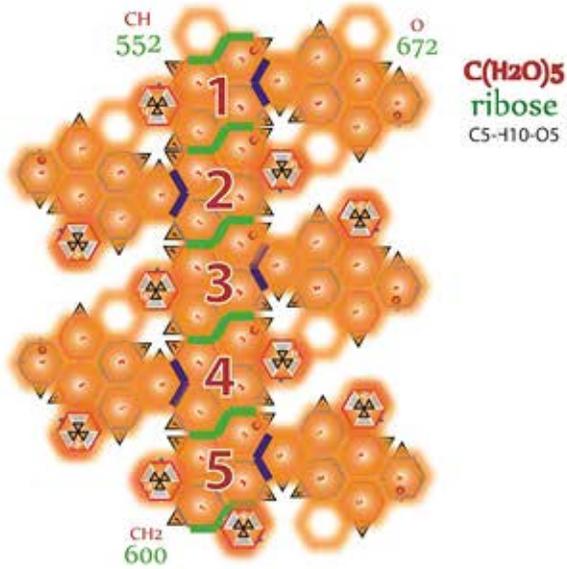
D-Glucose



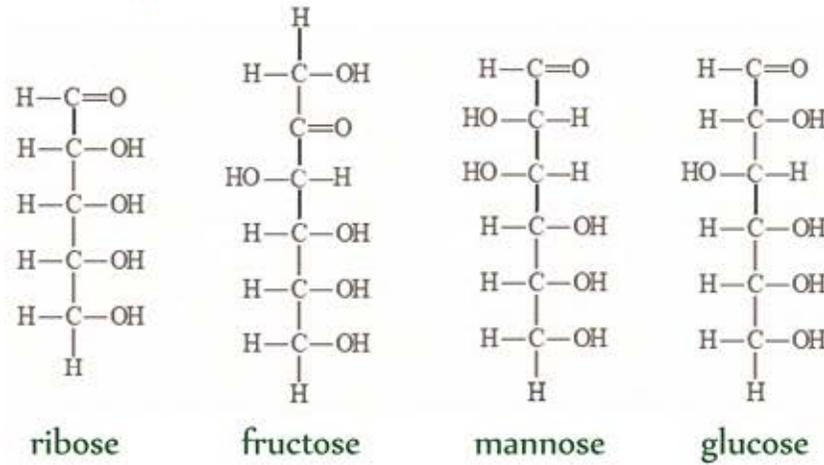
L-Glucose



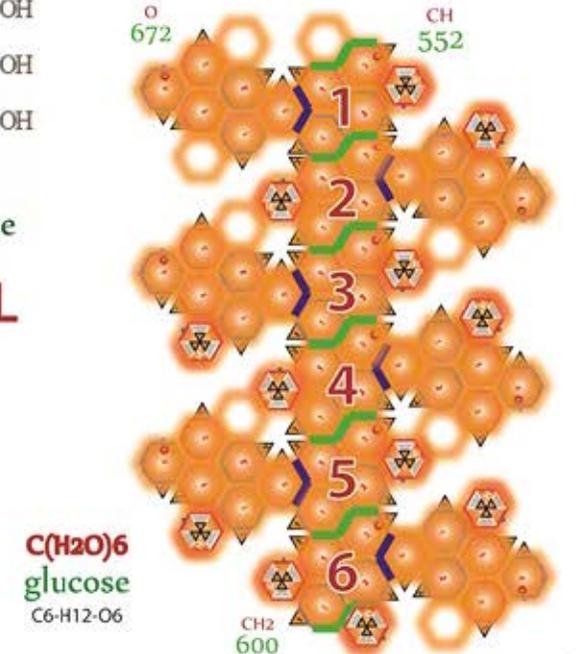
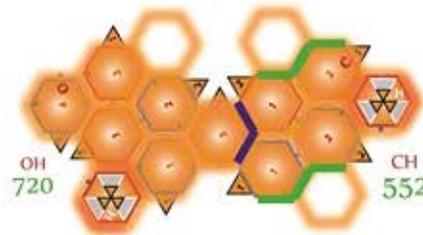
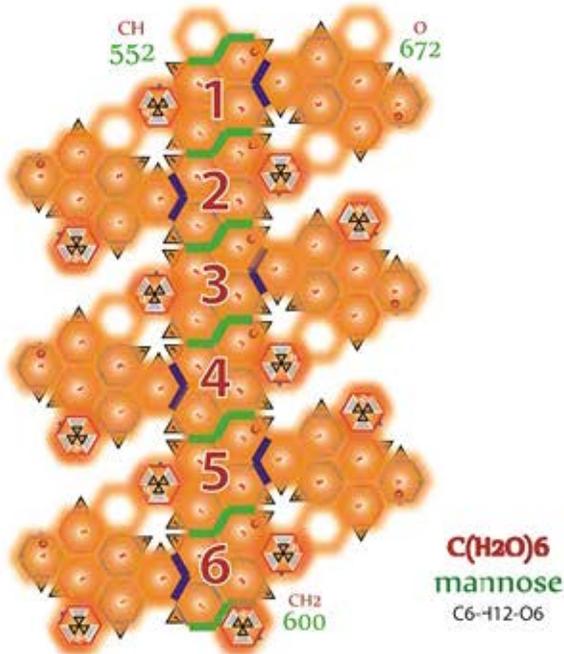
C(H₂O)₆
L-glucose
 C₆-H₁₂-O₆



Major Monosaccharides



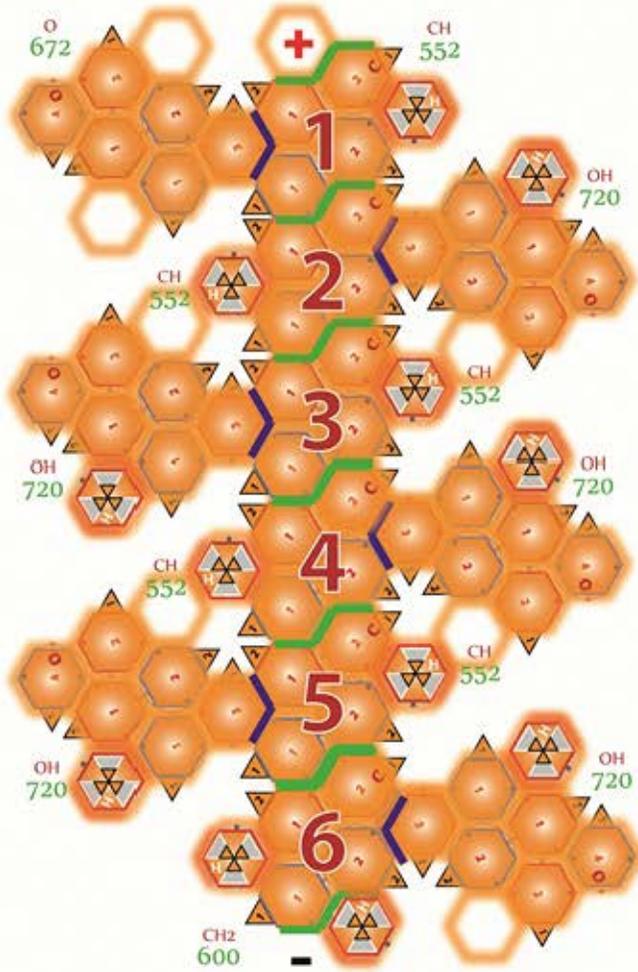
D D & L sugars are chiral, mirror images of one another and have the same name. **L**



A monosaccharide often switches from the acyclic (open-chain) form to a cyclic form, through a nucleophilic addition reaction between the carbonyl group and one of the hydroxyls of the same molecule.

cyclic monosaccharides

For many monosaccharides (including glucose), the cyclic forms predominate, and therefore the same name commonly is used for forms of isomers.

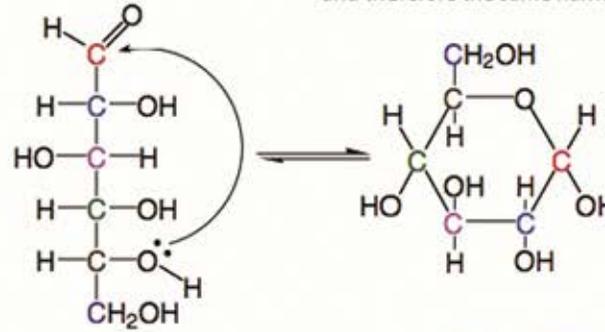


linear saccharide chain

The Carbon nuclei in Monosaccharides chains can join together to form cyclic [Carbon-Oxygen] rings or polycarbohydrates through condensation

acyclic monosaccharides

$C(H_2O)_6$
glucose
C6-H12-O6



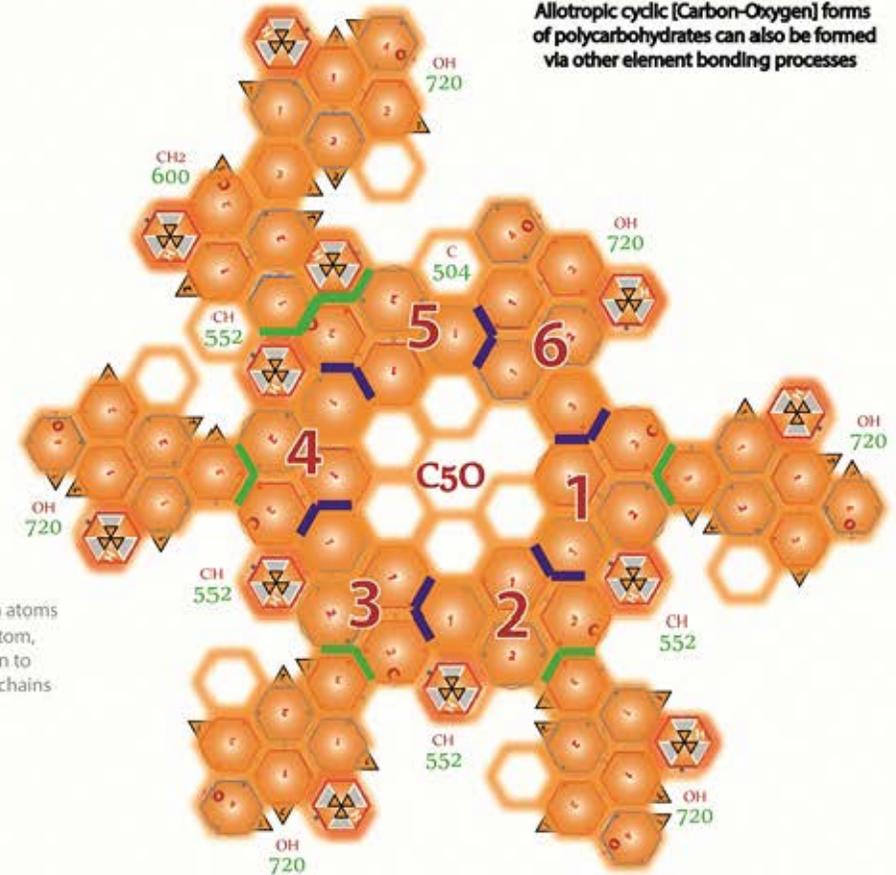
$C(H_2O)_6$
glucopyranose
C6-H12-O6

cyclic Oxygen-Carbon ring

Allotropic cyclic [Carbon-Oxygen] forms of polycarbohydrates can also be formed via other element bonding processes

$C_6-H_{12}-O_6$
7,632
[3,816-3,816]

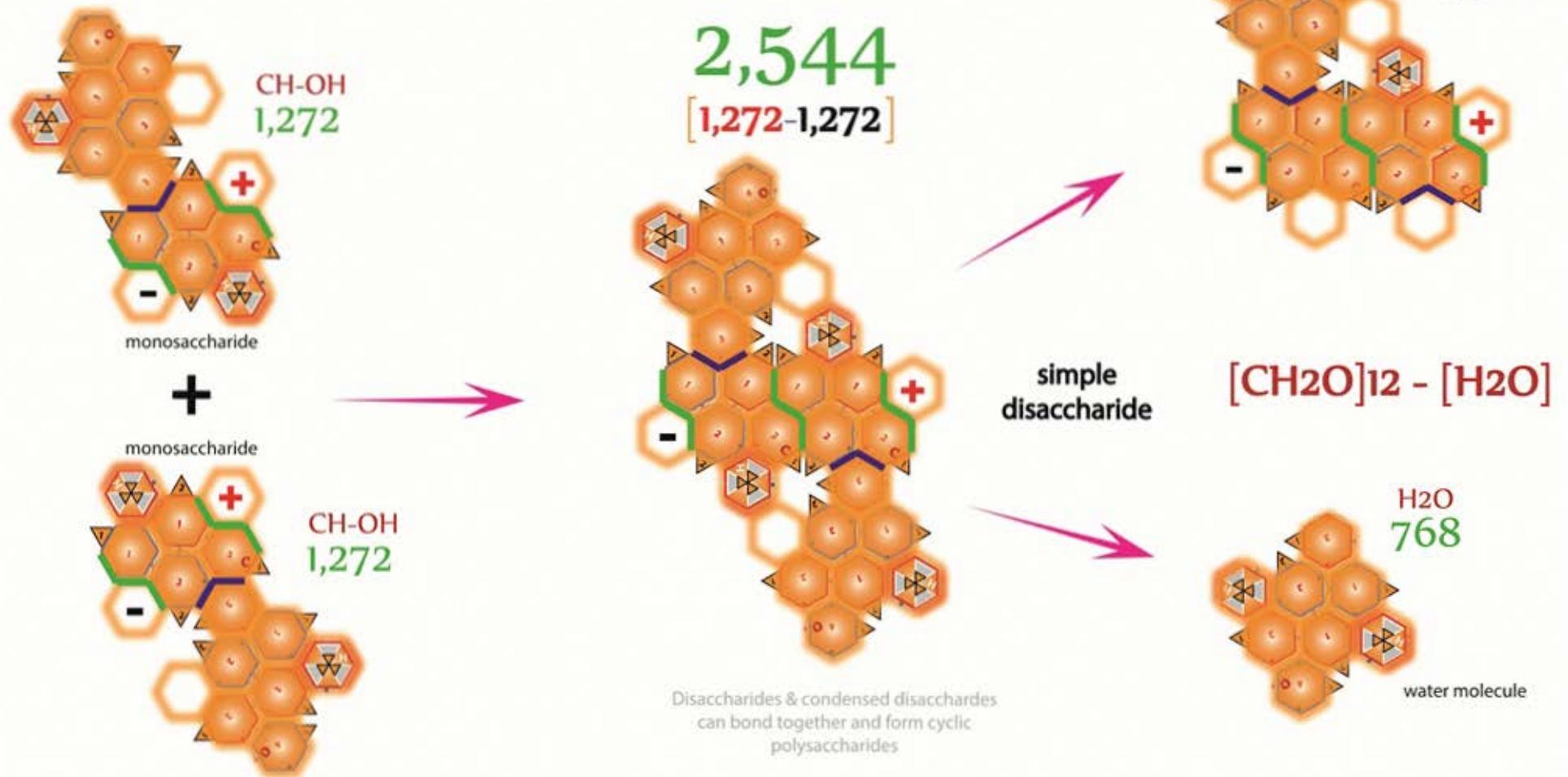
The reaction creates a ring of carbon atoms closed by one bridging oxygen atom, which in turn can be easily broken to restore the linear monosaccharide chains



Condensed Disaccharides

Condensed Disaccharides are formed when two monosaccharides are joined together and a molecule of water is removed

For example, milk sugar (lactose) is made from glucose and galactose whereas cane sugar (sucrose) is made from glucose and fructose



The reverse of this reaction, the formation of two monosaccharides from one disaccharide, is called a hydrolysis reaction and requires one water molecule to supply the H and OH to the sugars formed.

Sucrose is used in many plants for transporting food reserves, often from the leaves to other parts of the plant. Lactose is the sugar found in the milk of mammals and maltose is the first product of starch digestion and is further broken down to glucose before absorption in the human gut.

14,496
[7,248-7,248]

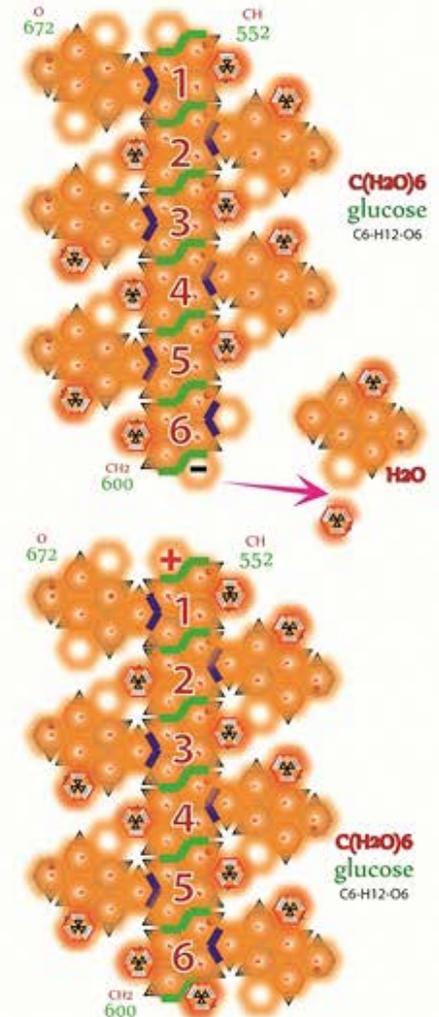
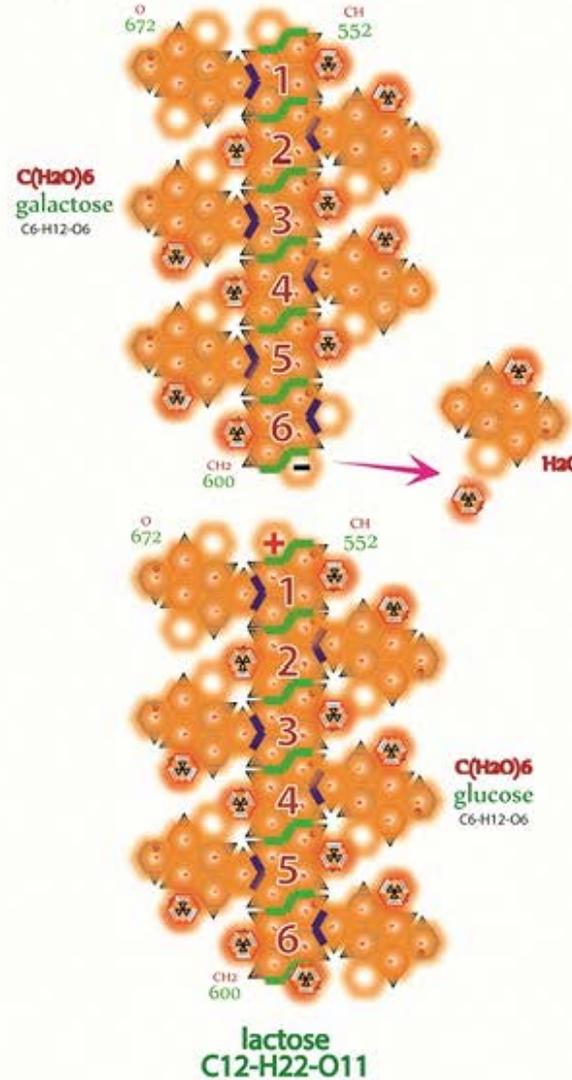
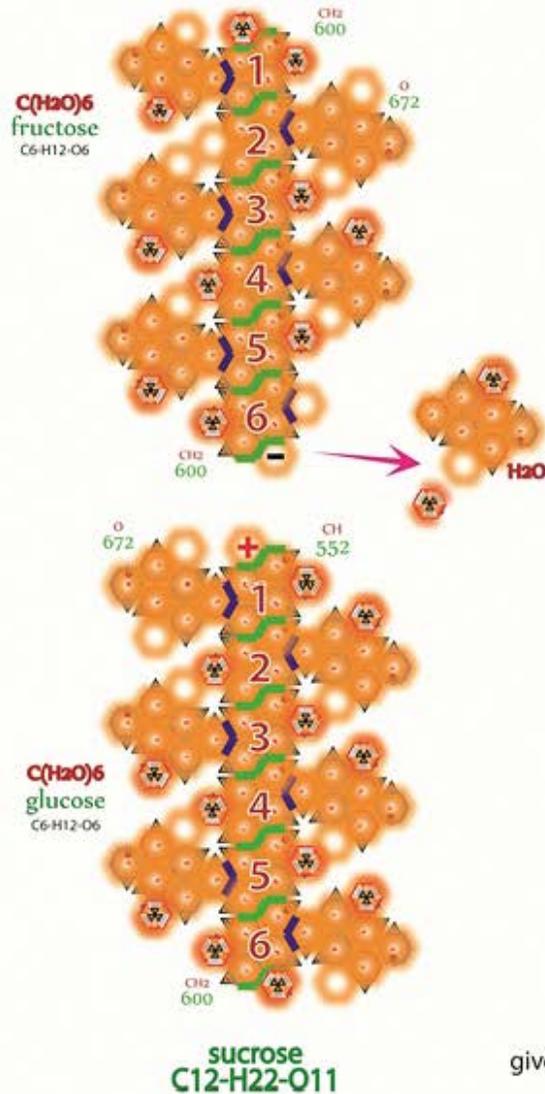
Disaccharides

Disaccharides are one of the four basic categories of carbohydrates, (the others are monosaccharides, oligosaccharides, and polysaccharides)

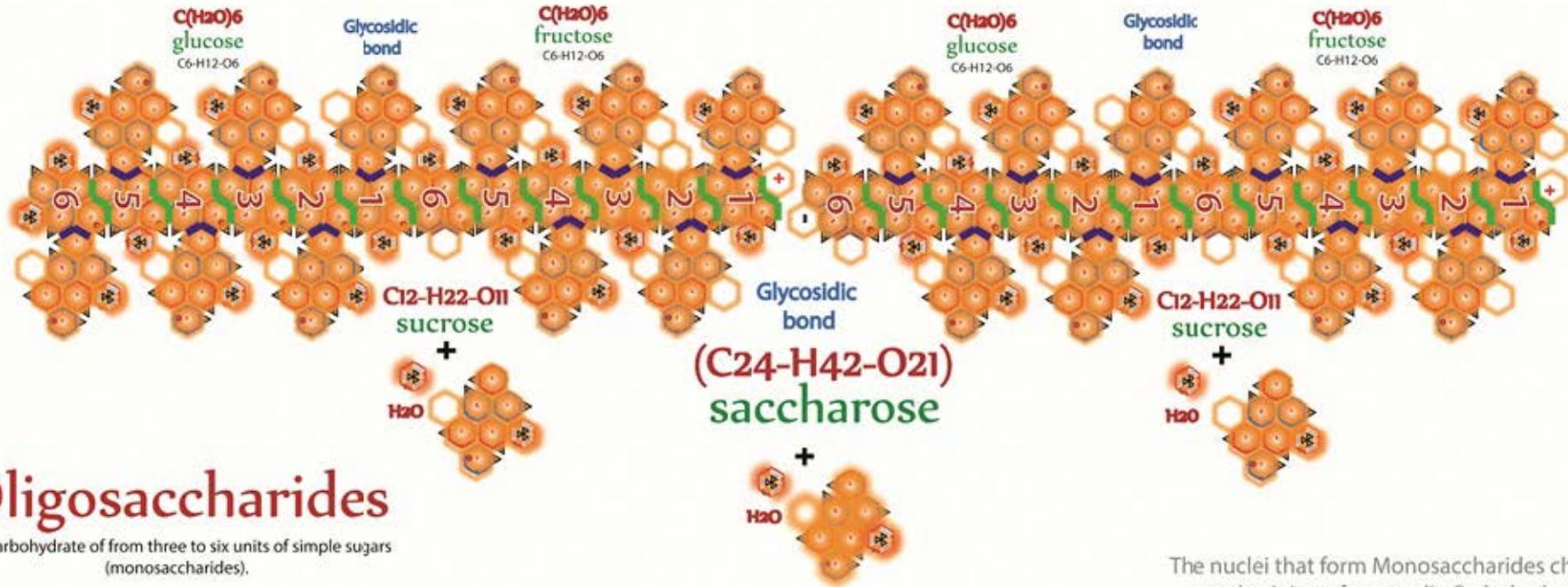
Monosaccharides, such as glucose, are the monomers out of which disaccharides are constructed.

$C_{12}-(H_2O)_{11}$

Disaccharides & condensed disaccharides can bond together and form cyclic polysaccharides



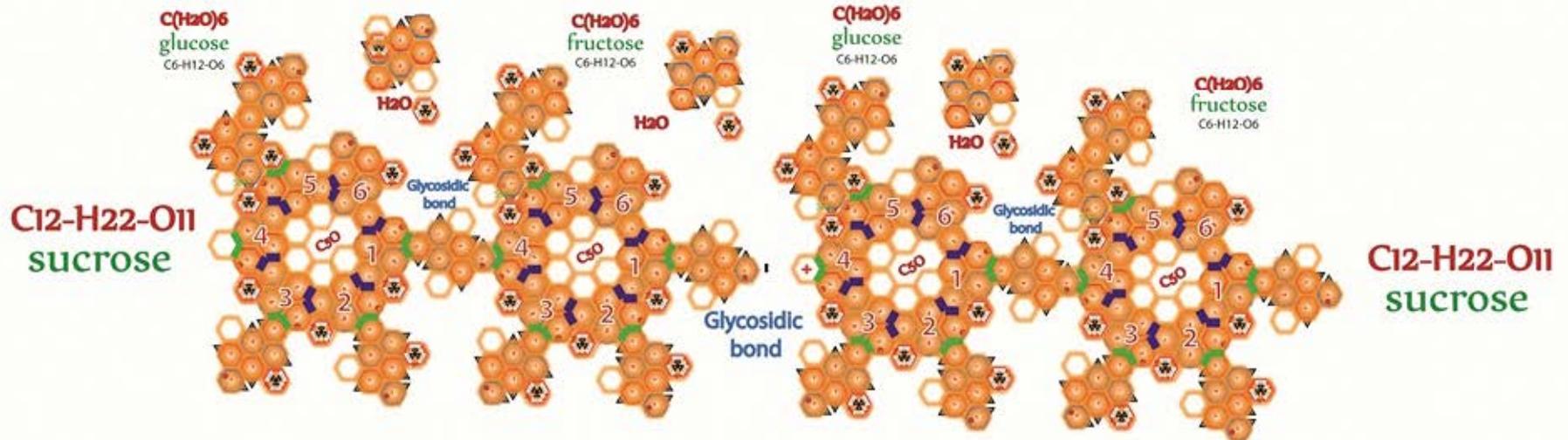
The general chemical formula for carbohydrates, $C(H_2O)_n$, gives the relative proportions of carbon, hydrogen, and oxygen in a monosaccharide (the proportion of these atoms are 1:2:1)-(H₂O)



Oligosaccharides

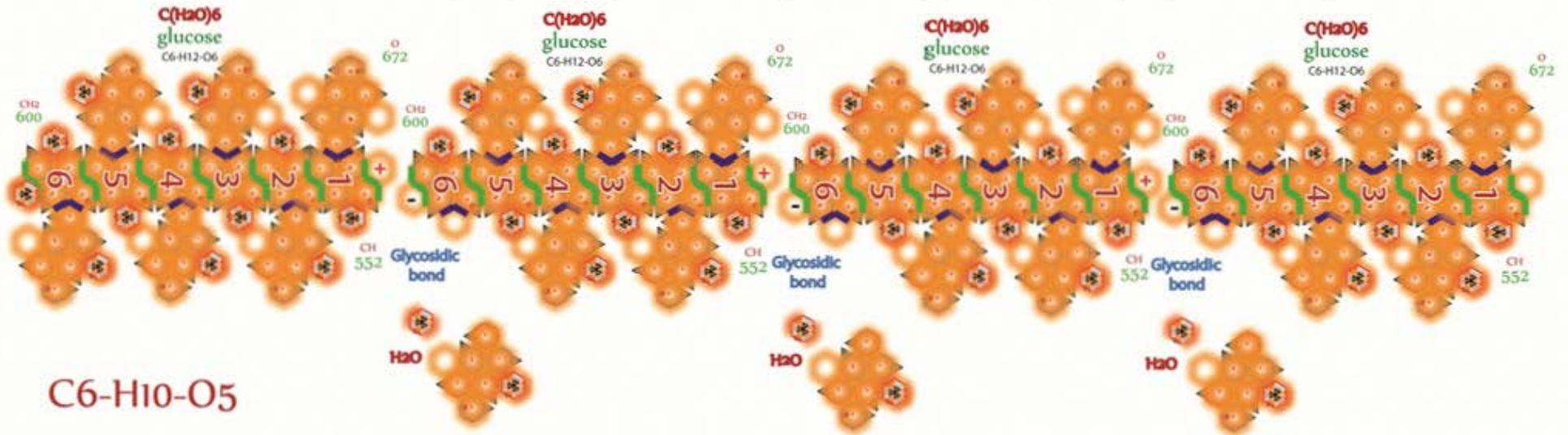
any carbohydrate of from three to six units of simple sugars (monosaccharides).

The nuclei that form Monosaccharides chains can also join to form cyclic Carbohydrates [Polysaccharides]



An oligosaccharide is a saccharide polymer containing a small number (typically two to ten) component sugars (monosaccharides). Oligosaccharides can have many functions; for example, they are commonly found on the plasma membrane of animal cells where they can play a role in cell-cell recognition.

Starch or amyllum is a carbohydrate consisting of a large number of glucose units joined by glycosidic bonds. This polysaccharide is produced by most green plants as an energy store.



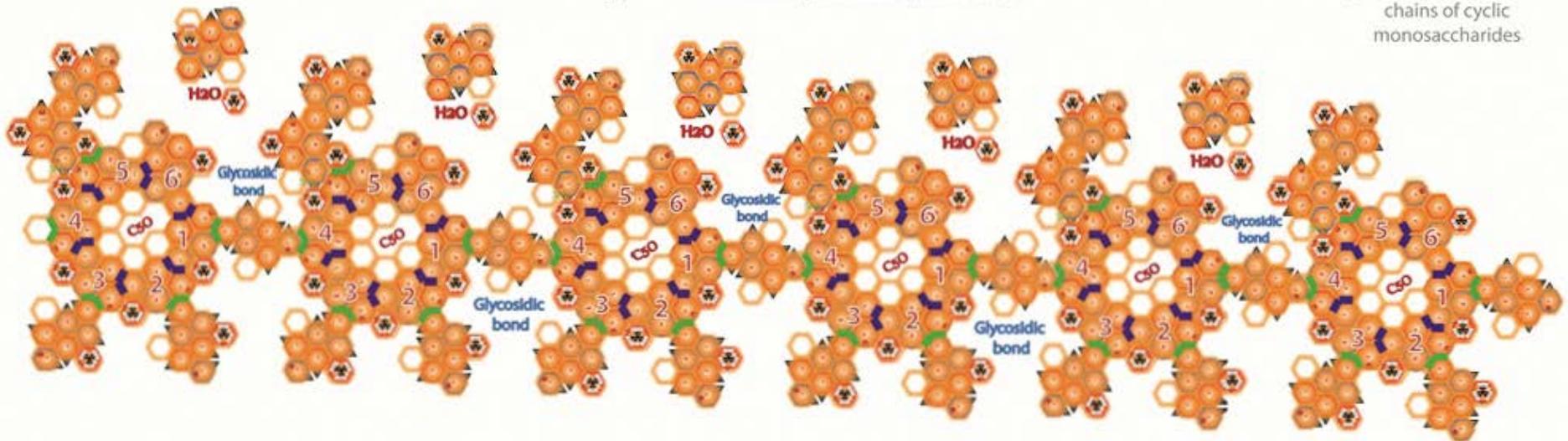
Polysaccharides

Polysaccharides have a general formula of $C_x(H_2O)_y$ where x is usually a large number between 200 and 2500.



Polysaccharides are generally comprised of chains of cyclic monosaccharides.

The repeating units in a Polysaccharide polymer backbone are often six-carbon monosaccharides, their general formula can be represented as $(C_6H_{10}O_5)_n$

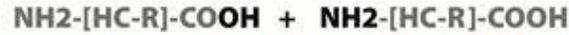


Cellulose is an organic compound with the formula $(C_6H_{10}O_5)_n$, a polysaccharide consisting of a linear chain of several hundred to over ten thousand linked D-glucose sugars.

Amines



Amines are organic compounds that contain Nitrogen

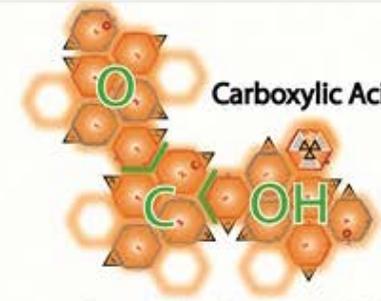


As both the amine and carboxylic acid groups of amino acids can react to form amide bonds, one amino acid molecule can react with another and become joined through an amide linkage. This polymerization of amino acids is what creates proteins.



This yields a peptide bond and a molecule of water via a condensation reaction

Carboxylic Acids

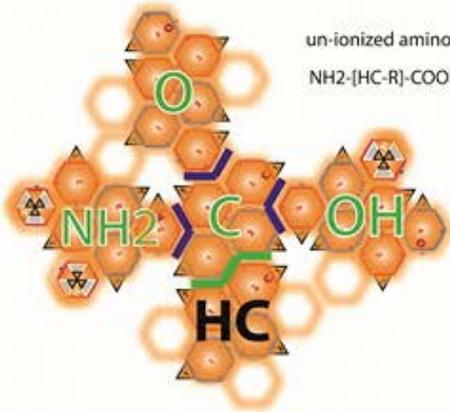


The general formula of a carboxylic acid is R-COOH

Amino Acids

Amino acids are biologically important organic compounds made from amine and carboxylic acid functional groups, along with a side-chain specific to each amino acid

un-ionized amino acid
NH₂-[HC-R]-COOH

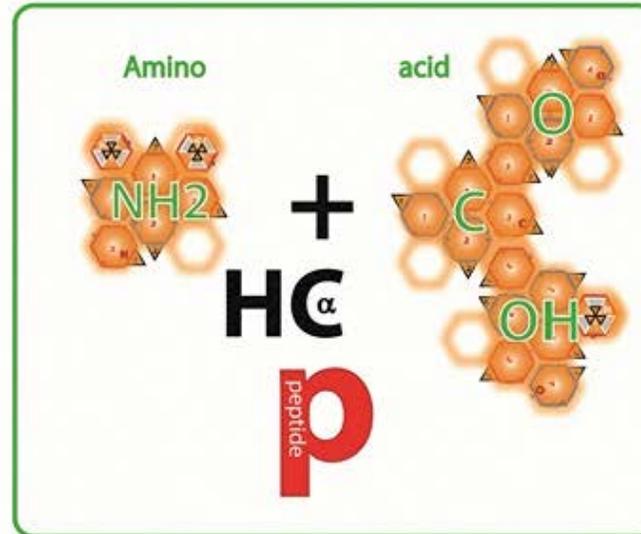


zwitterionic amino acid
NH₃⁺-[HC-R]-COO⁻

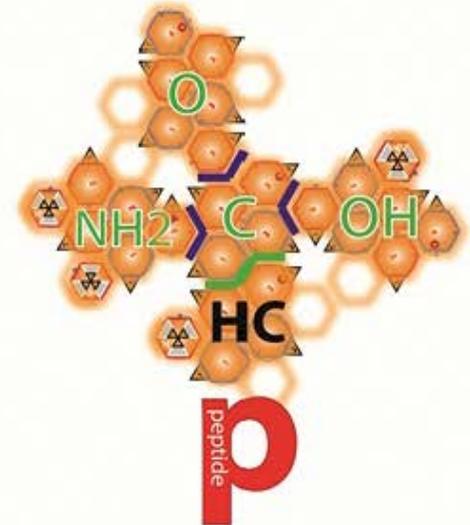


The α-carbon.

The α-amino acids in peptides and proteins consist of a carboxylic acid (-COOH) and an amino (-NH₂) functional group attached to the same tetrahedral carbon atom



The peptide group attached to the alpha carbon distinguishes one amino acid from another (Tetryonic theory defines these compound side-chains of atoms as peptides [p])



Peptide side chains

Amino acids are the structural units (monomers) that join together to form short polymer chains called peptides; or longer chains called either polypeptides or proteins



AAA
AAG
AAC
AAU
AGA
AGG
AGC
AGU
ACA
ACG
ACC
ACU
AUA
AUG
AUC
AAU

A
C5-H5-N5
Adenine

CAA
CAG
CAC
CAU
CGA
CGG
CGC
CGU
CCA
CCG
CCC
CCU
CUA
CUG
CUC
CUU

C
C4-H5-N3-O
Cytosine

GAA
GAG
GAC
GAU
GGA
GGG
GGC
GGU
GCA
GCG
GCC
GCU
GUA
GUG
GUC
GUU

G
C5-H5-N5-O
Guanine

3,180
Gly
C2H5NO2

3,780
Ala
C3H7NO2

4,452
Ser
C3H7NO3

4,884
Pro
C5H9NO2

4,980
Val
C5H11NO2

5,052
Thr
C4H9NO3

5,124
Cys
C3H7NO2S

5,580
Lle
C6H13NO2

5,580
Leu
C6H13NO2

5,592
Asn
C4H8N2O3

5,628
Asp
C4H7NO4

P
peptide side chain

current chemical theory hypothesizes that all peptides and proteins are the result of codon triplet side chains on amino acids

Tetryonic theory reveals serious flaws in this line of thought

6,192
Gln
C5H10N2O3

6,216
Lys
C6H14N2O2

6,228
Glu
C5H9NO4

6,324
Met
C5H11NO2S

6,564
His
C6H9N3O2

6,996
Phe
C9H11NO2

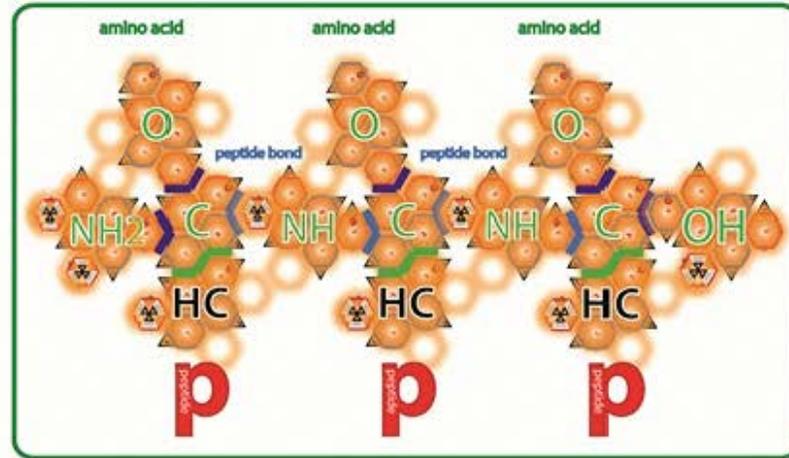
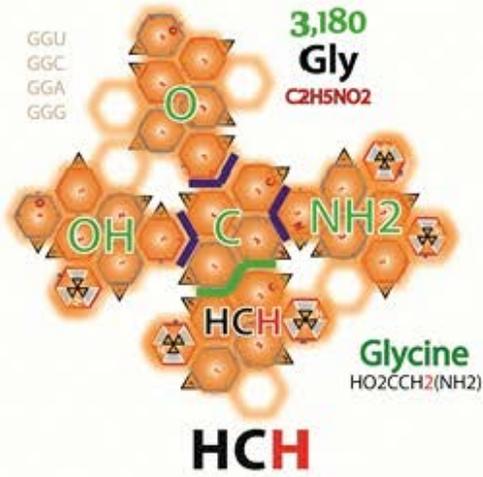
7,392
Arg
C6H14N4O2

7,668
Tyr
C9H11NO3

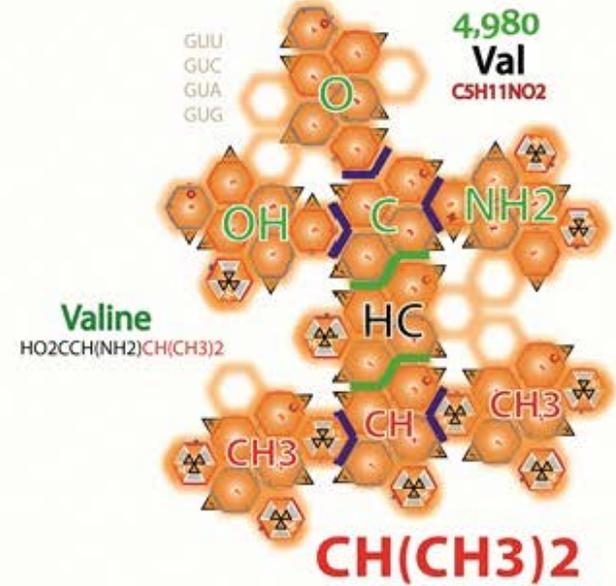
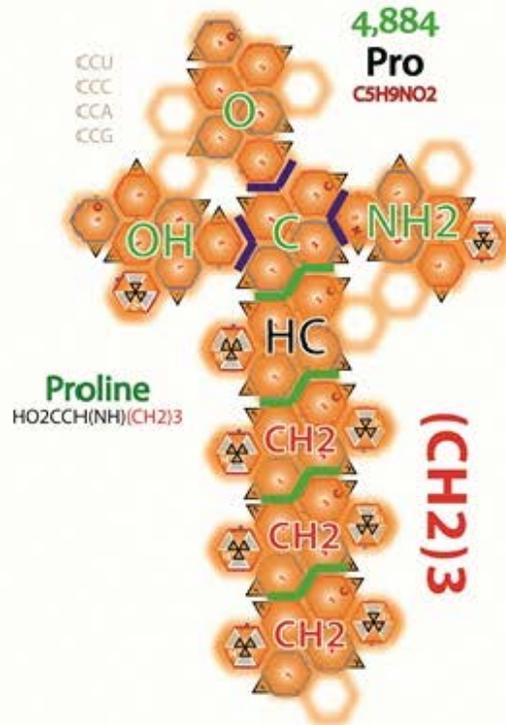
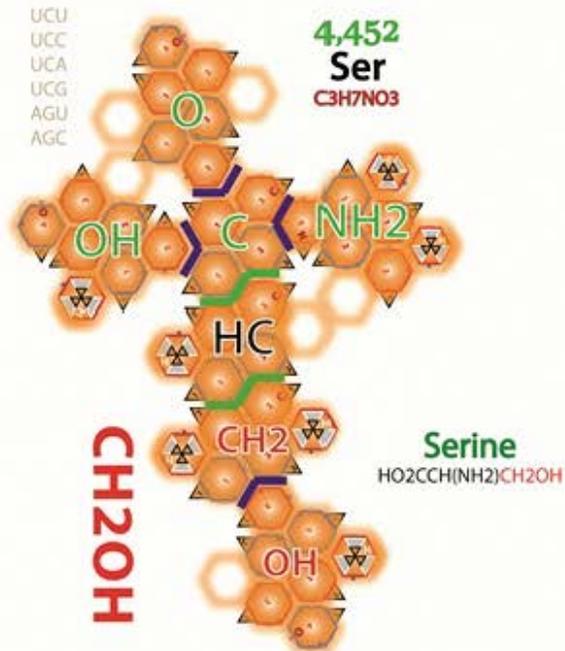
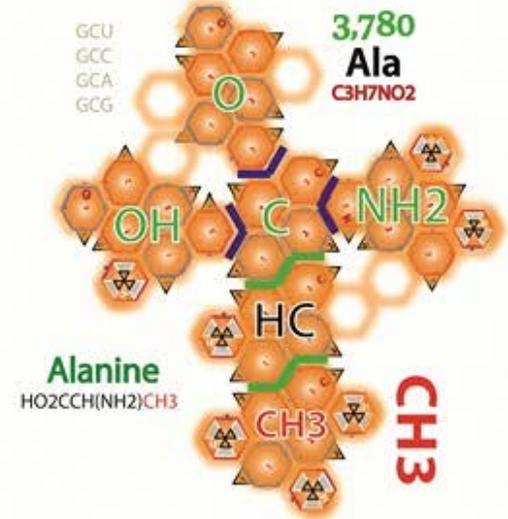
8,640
Trp
C11H12N2O2

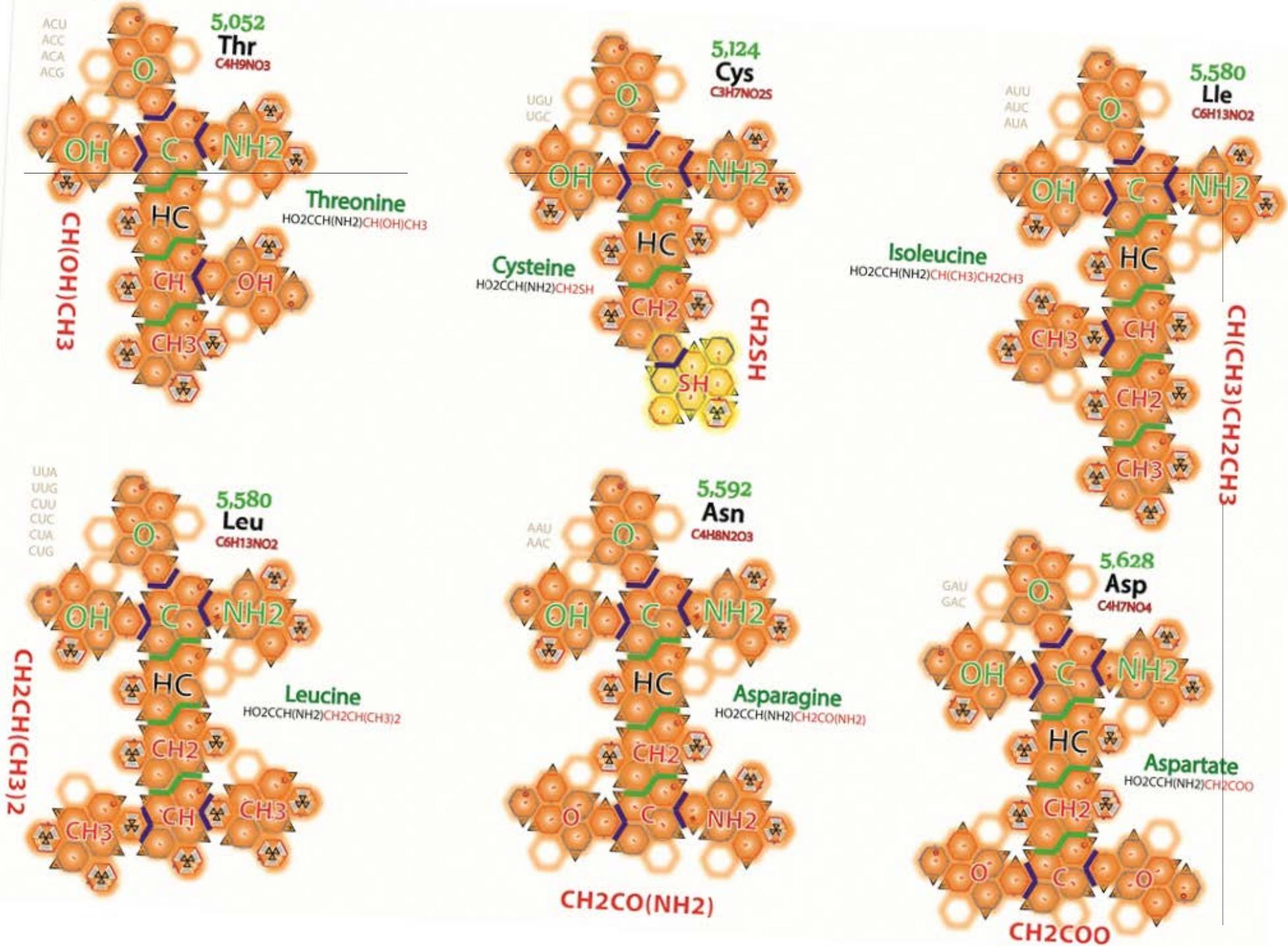
U
C4-H4-N2-O2
Uracil

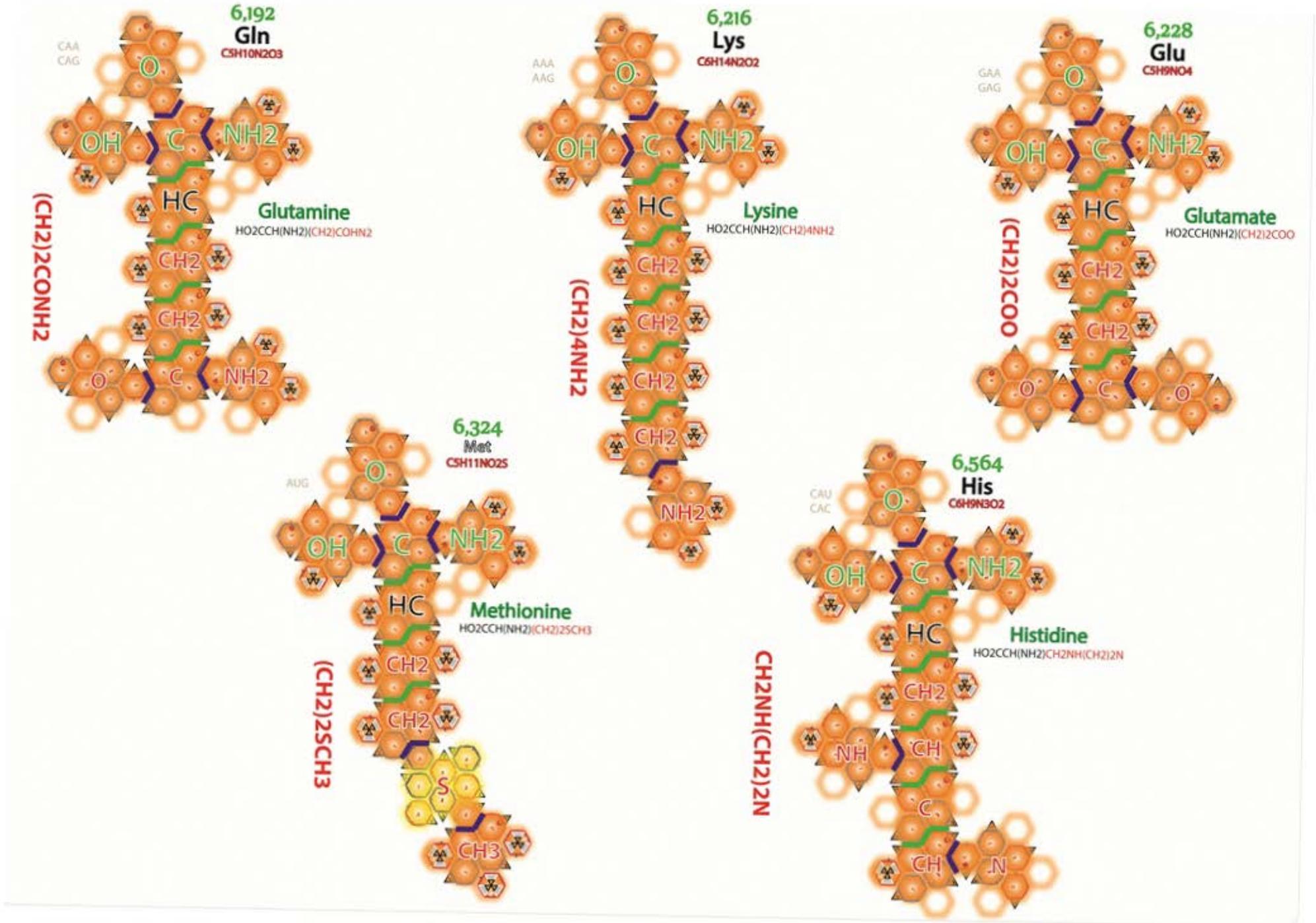
UAA
UAG
UAC
UAU
UGA
UGG
UGC
UGU
UCA
UCG
UCC
UCU
UUA
UUG
UUC
UUU

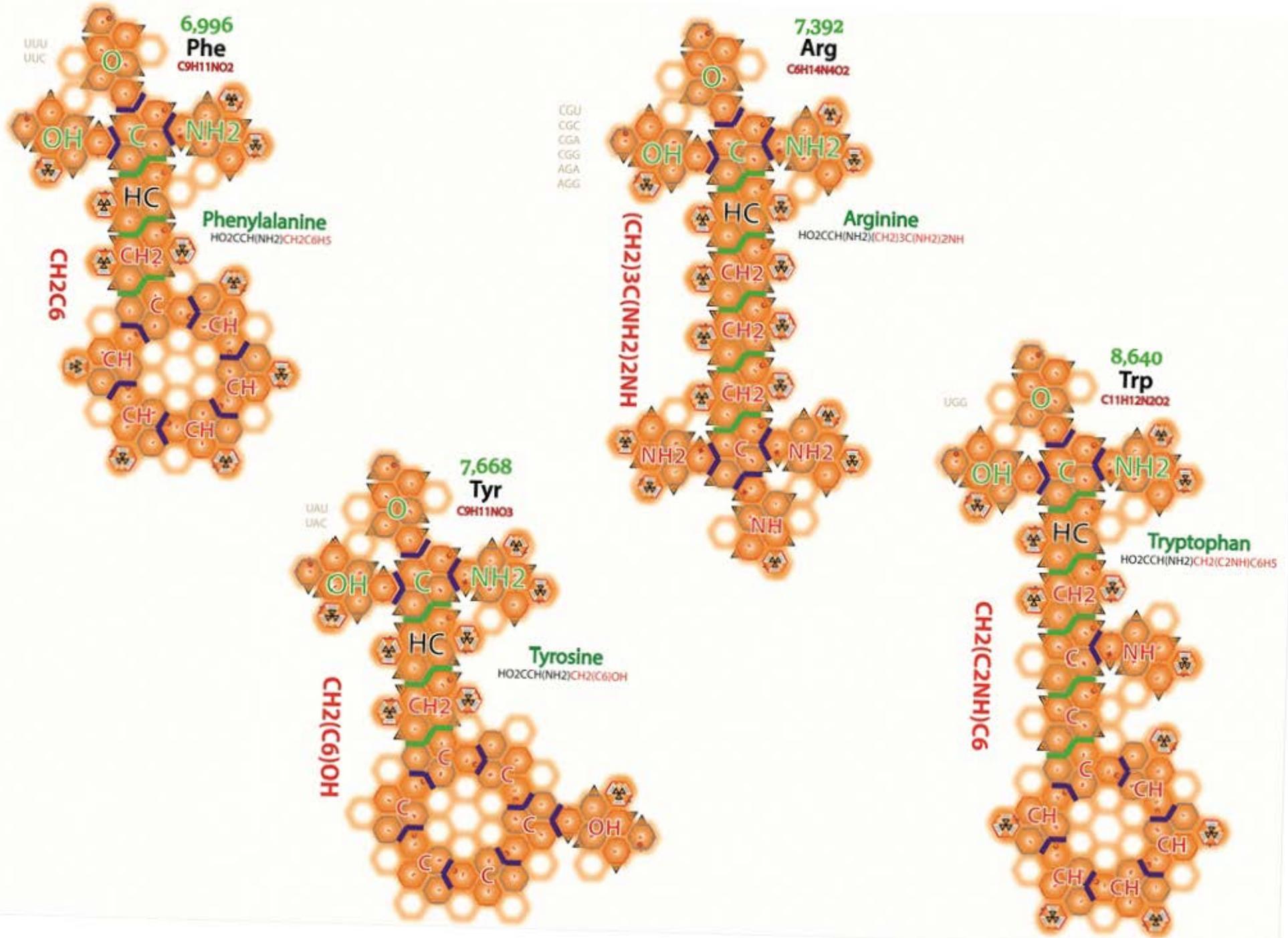


poly-peptide chains



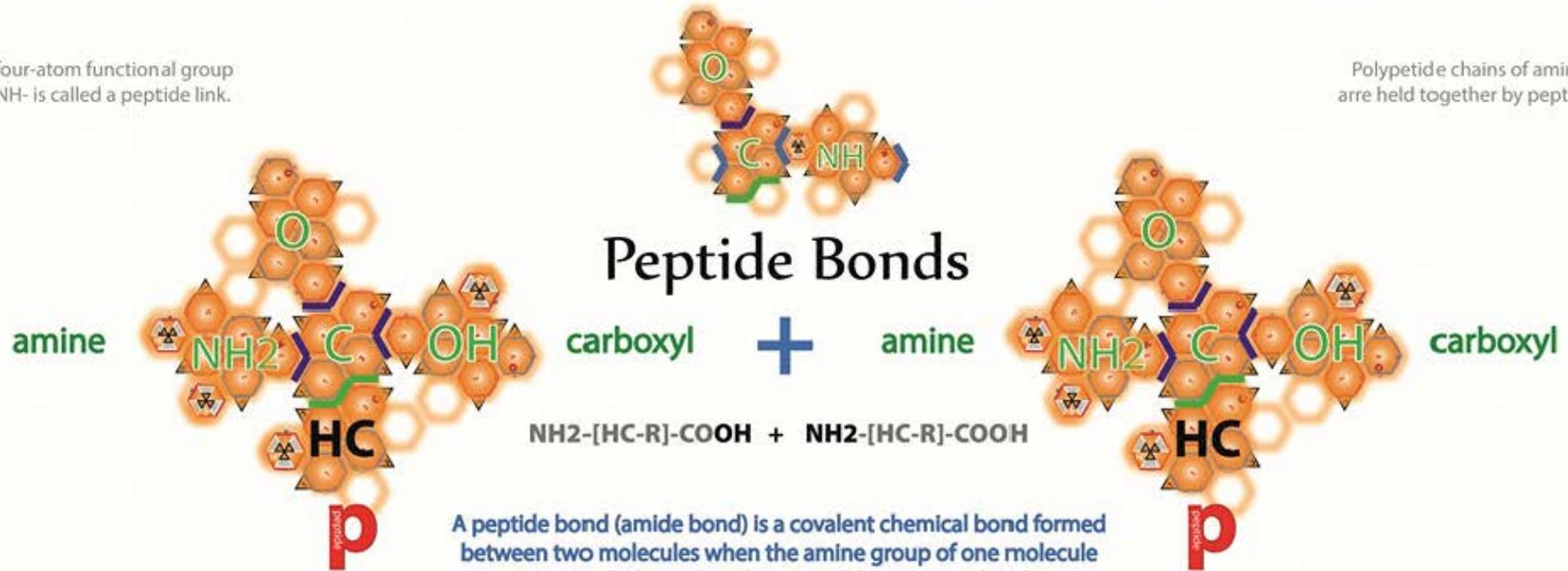




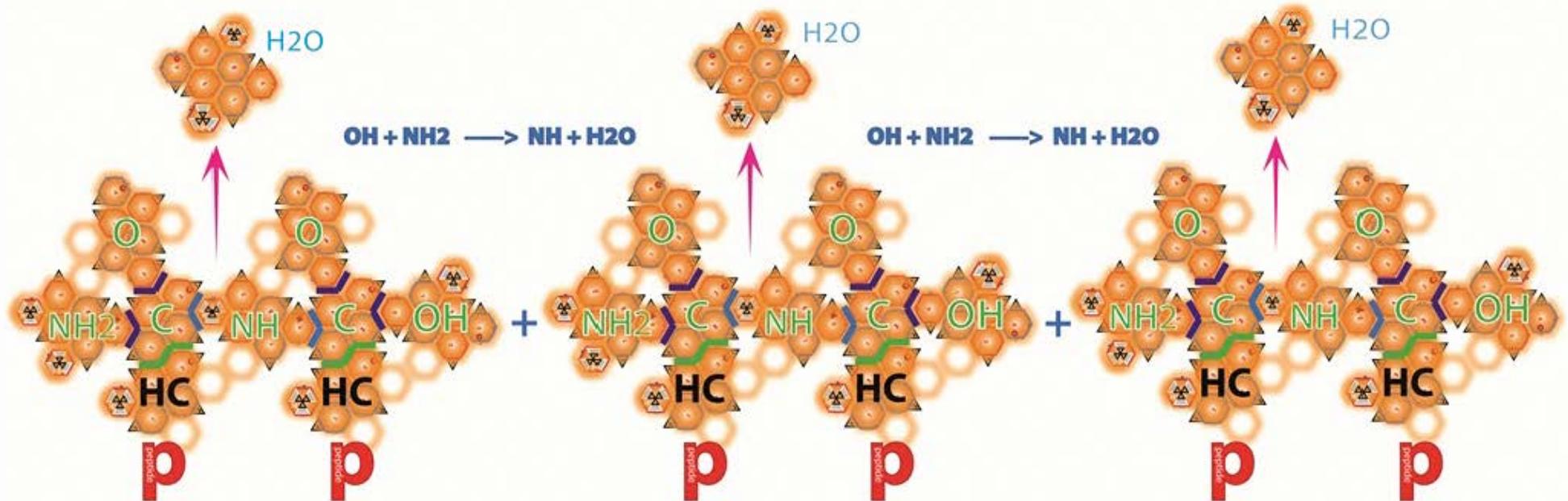


The four-atom functional group
-CONH- is called a peptide link.

Polypeptide chains of amino acids
are held together by peptide bonds

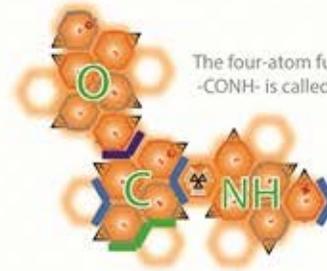
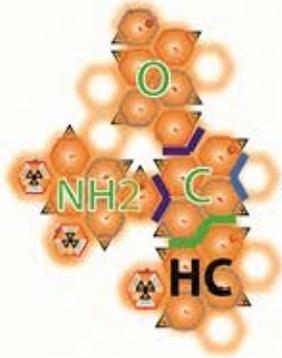


A peptide bond (amide bond) is a covalent chemical bond formed between two molecules when the amine group of one molecule reacts with the carboxyl group of the other molecule, causing the release of a molecule of water (H₂O),



amino terminus

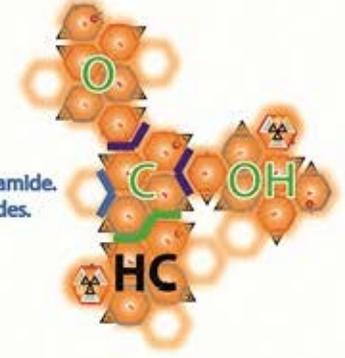
The beginning of a polypeptide protein molecule has a free amino group.



The four-atom functional group -CONH- is called a peptide link.

carboxy terminus

The end of a polypeptide protein molecule has a free carboxyl group.

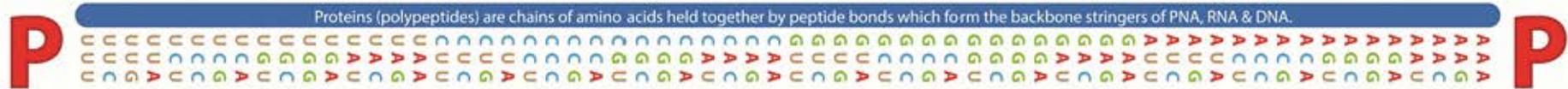


Proteins [poly-peptides] are formed by joining the -CO₂H [carboxyl] end of one amino acid with the -NH₂ [amine] end of another to form an amide. The -CONH- bond between amino acids is known as a peptide bond because relatively short polymers of amino acids are known as peptides.

polypeptide chains

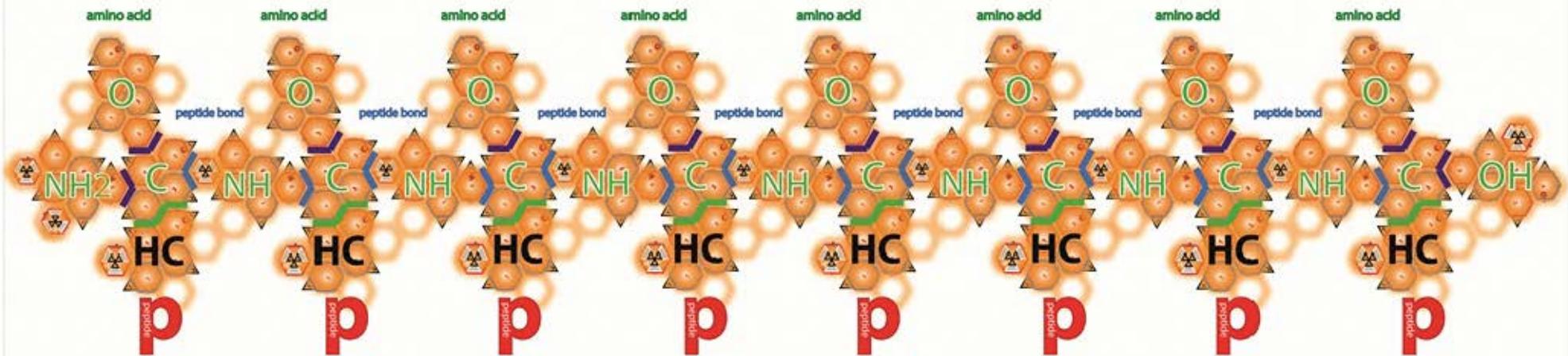
Proteins are formed when amino acids are covalently linked together.

DNA and RNA have a deoxyribose and ribose sugar backbone, respectively, whereas PNA's backbone is composed of repeating (2-aminoethyl)-glycine units linked by peptide bonds.



Proteins (polypeptides) are chains of amino acids held together by peptide bonds which form the backbone strings of PNA, RNA & DNA.

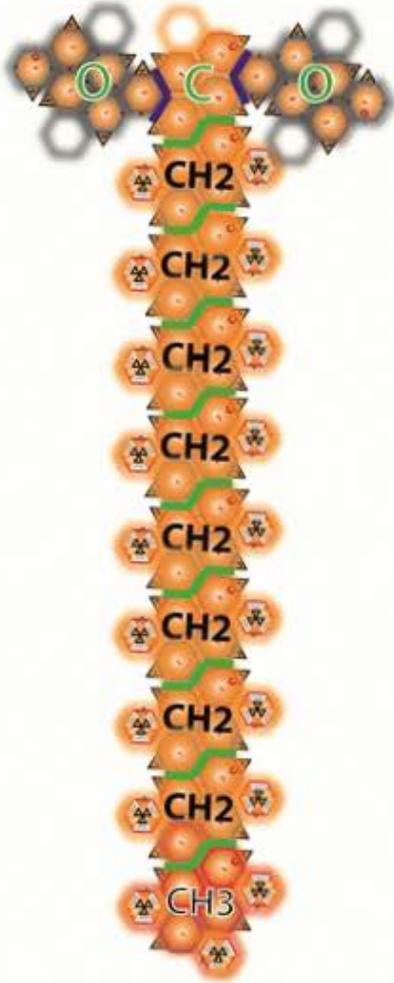
Proteins



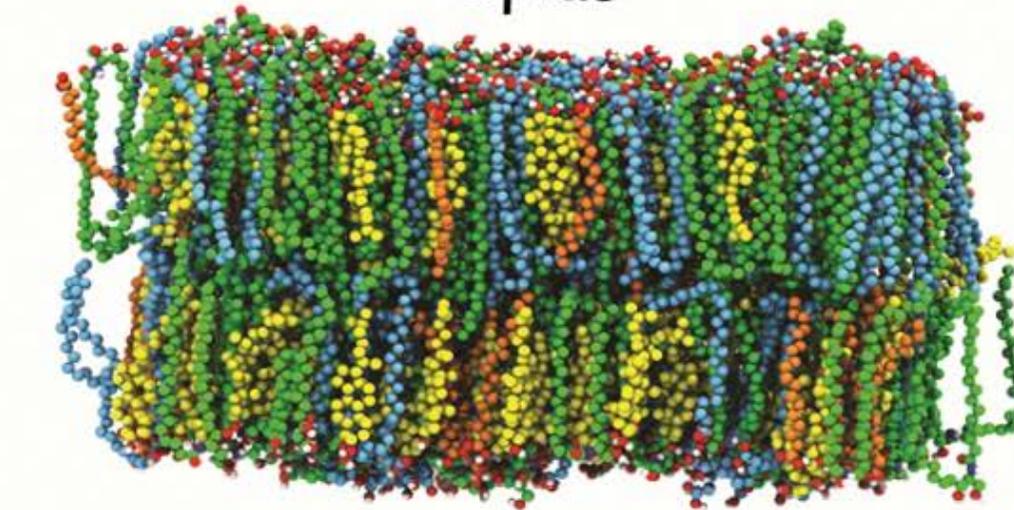
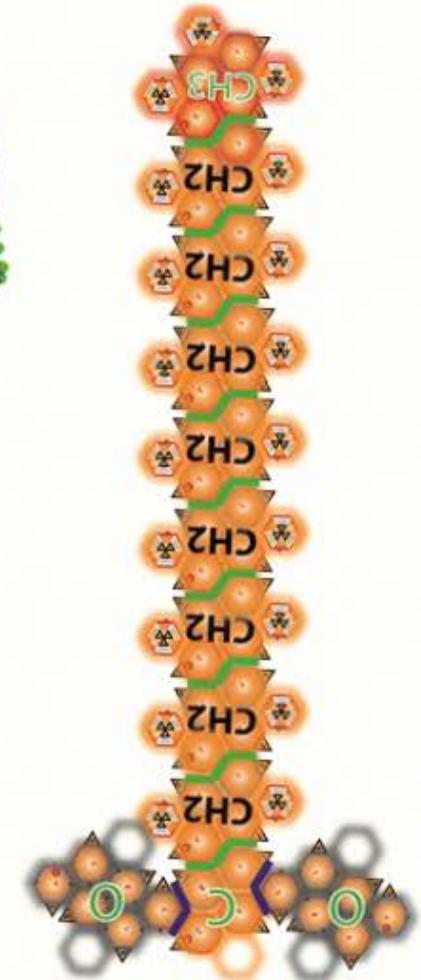
There are 20 different nucleotide side chains present in biological molecules.

Lipids

hydrophilic

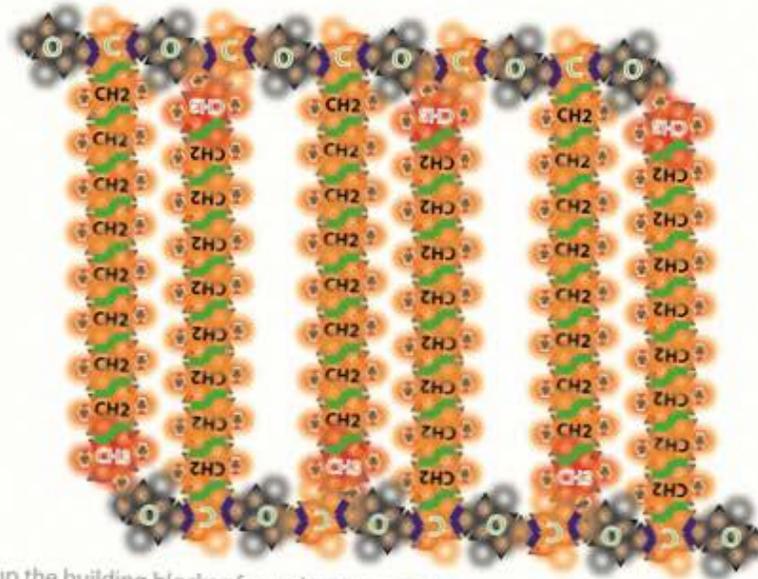


hydrophobic



Lipids are a group of naturally occurring molecules that include fats, waxes, sterols, fat-soluble vitamins (such as vitamins A, D, E, and K), mono-glycerides, di-glycerides, tri-glycerides, phospho-lipids, and others.

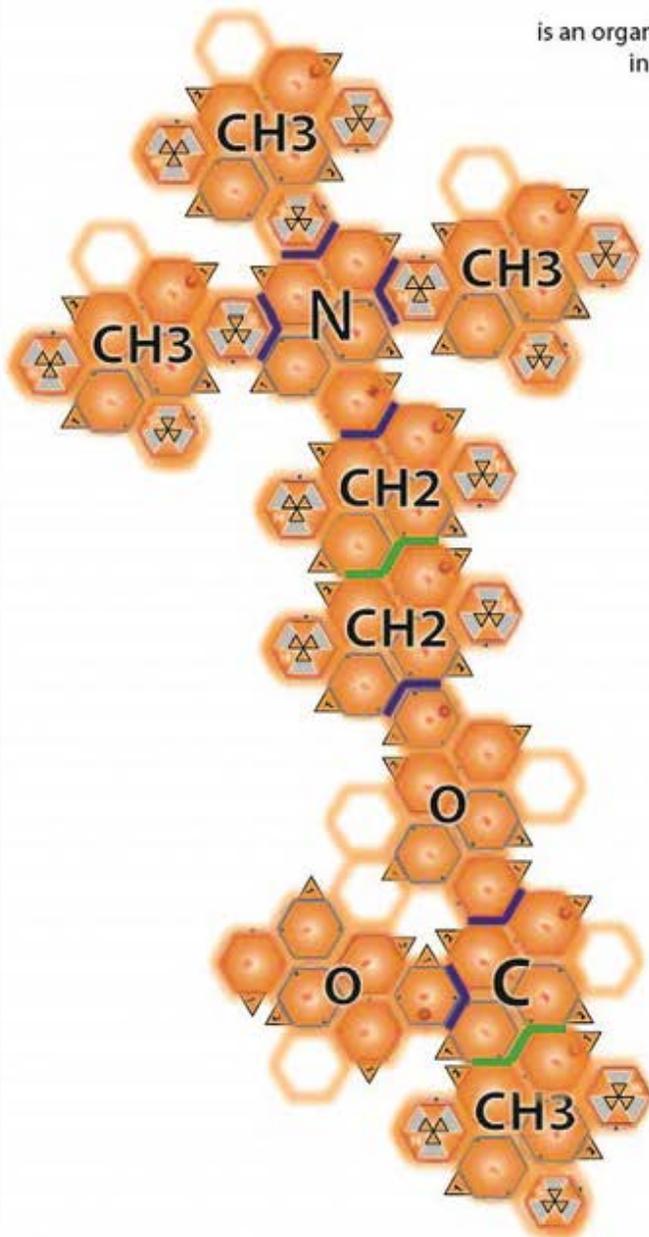
hydrophobic



hydrophilic

Lipids are molecules that contain hydrocarbons and make up the building blocks of membranes, providing a semi-permeable barrier between a living cell's internal & external environments.

Lewis chemical structure



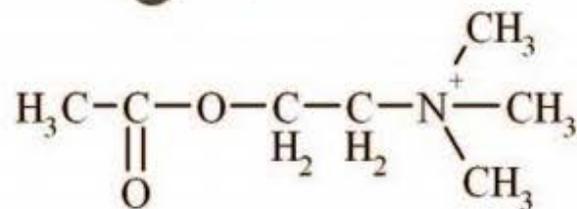
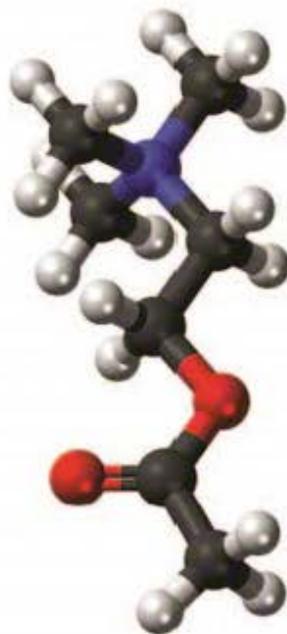
Acetylcholine

is an organic molecule that acts as a neurotransmitter in many organisms, including humans. It is an ester of acetic acid and choline

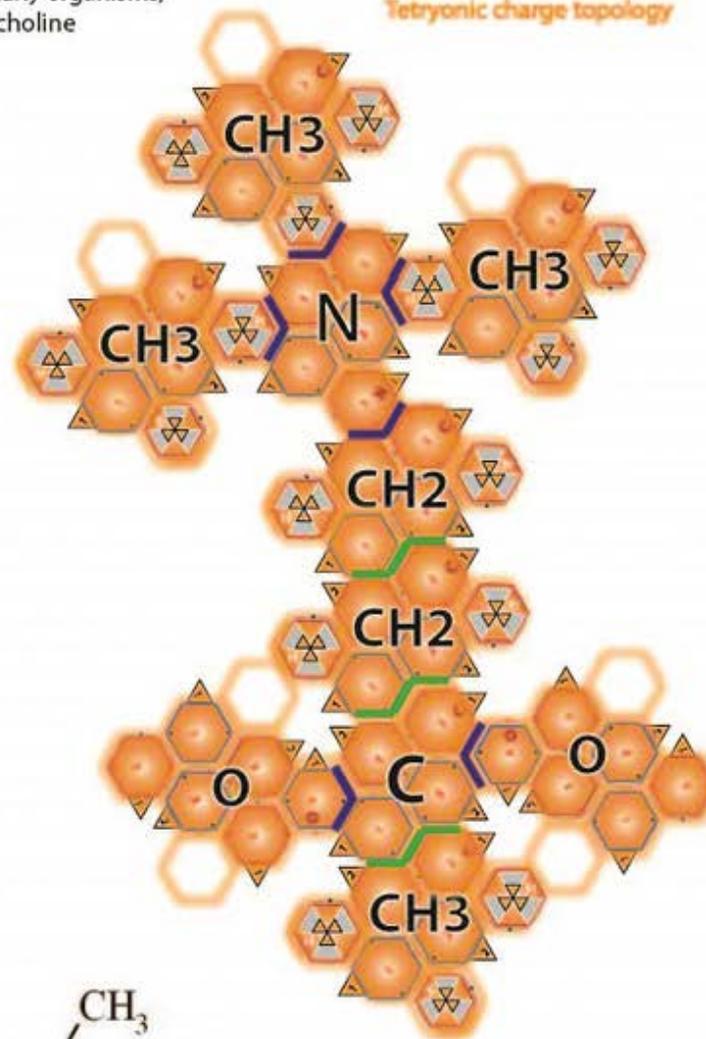
Ach

C7H16NO2

CH3COO(CH2)2N+(CH3)3



Tetryonic charge topology



6,228

Ribose

6,360

[3,180-3,180]

C₅-H₁₀-O₅

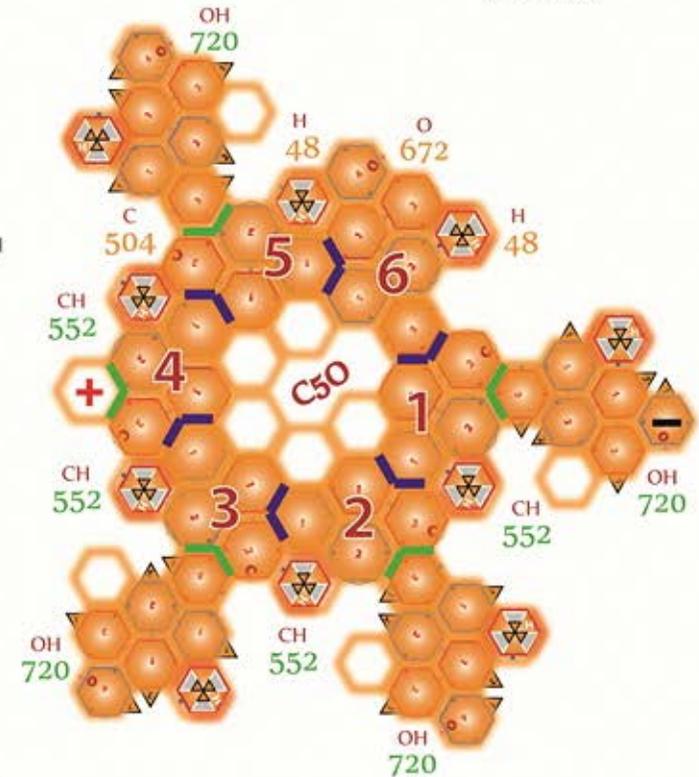
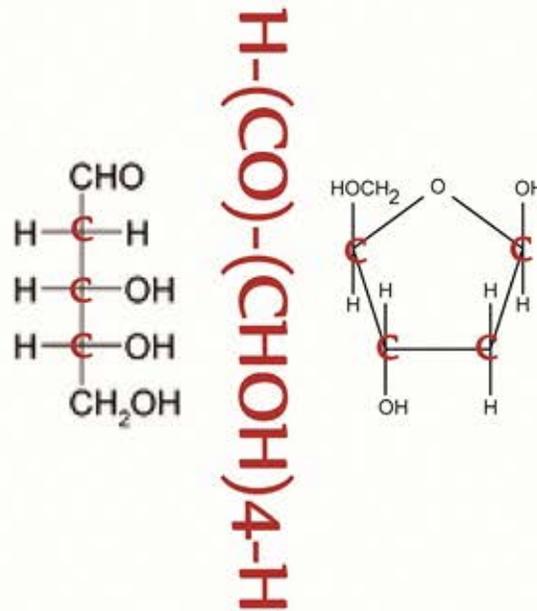
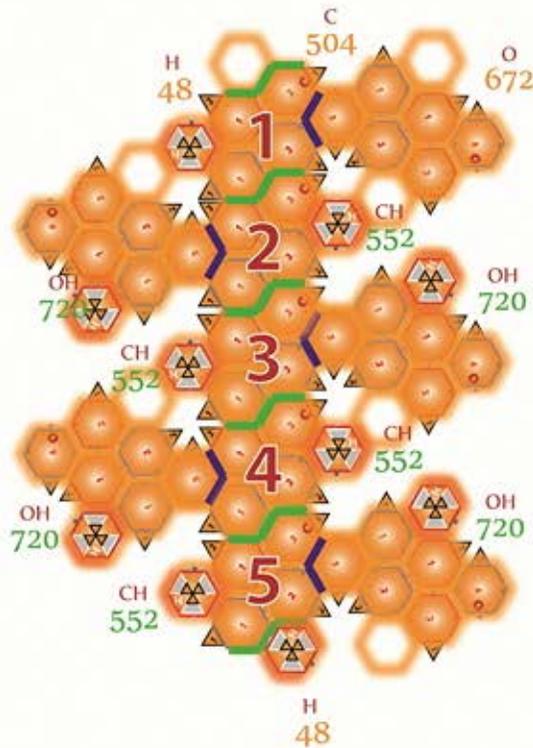
Carbohydrate compounds
can form acyclic sugars

Carbohydrate compounds
can also form cyclic sugars

Ribose is an organic compound with the formula C₅H₁₀O₅; specifically, a monosaccharide (simple sugar) with linear form H-(C=O)-(CHOH)₄-H

C(H₂O)₅
ribose
C₅-H₁₀-O₅

C(H₂O)₅
ribose
C₅-H₁₀-O₅



Ribose forms part of the backbone of RNA.
It is related to deoxyribose, which is found in DNA.

Ribose is present within every living cell of the body and is used to manufacture ATP (the energy currency of the cell) from scratch. Whilst the body can manufacture its own ribose from glucose, this requires energy and is a very slow process.

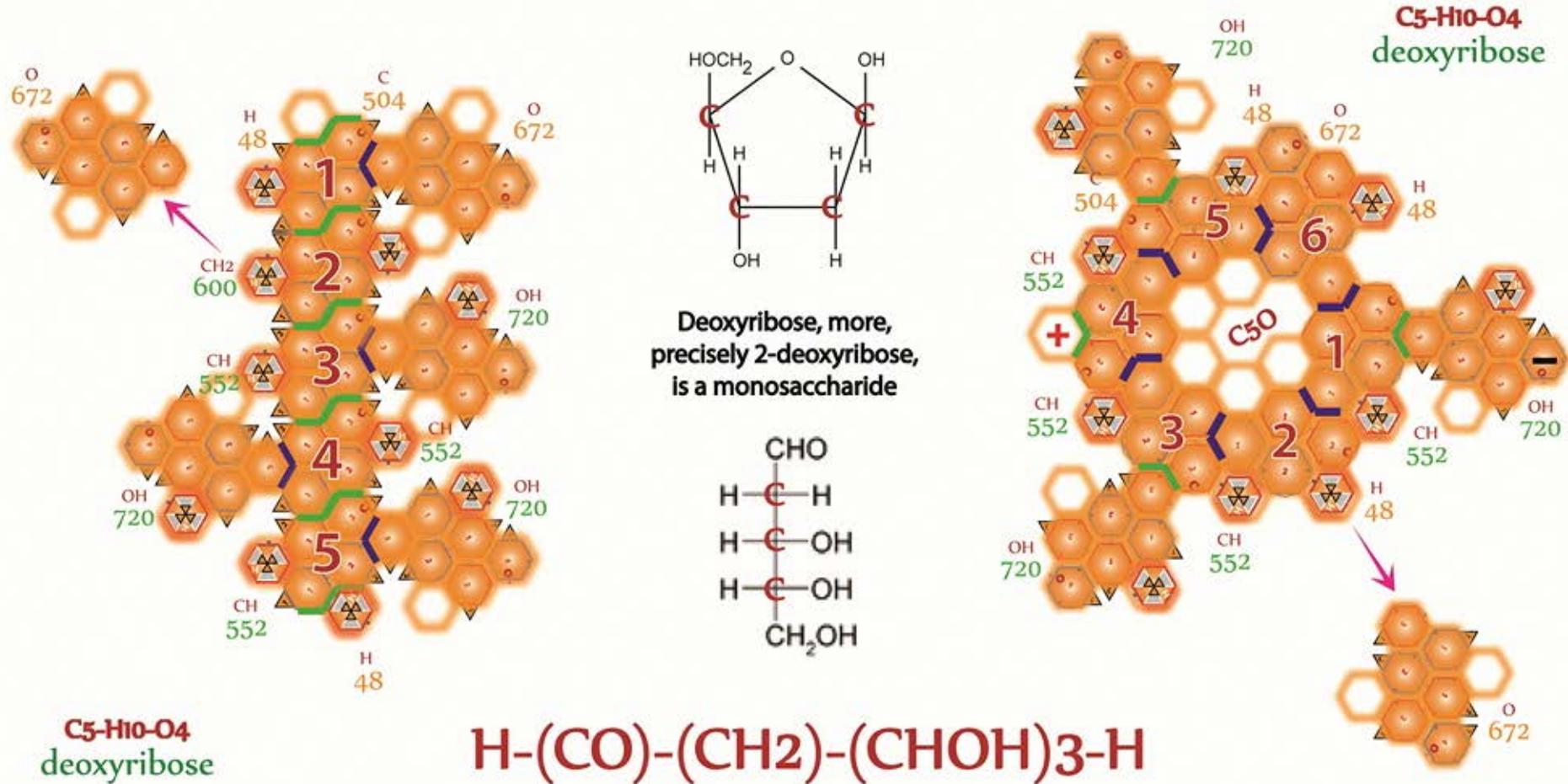
As its name indicates it is a deoxygenated sugar, meaning that it is derived from the sugar ribose by loss of an oxygen atom

Deoxyribose

5,688
[2,844-2,844]

As a component of DNA, 2-deoxyribose derivatives have an important role in biology

The DNA (deoxyribonucleic acid) molecule, which is the main repository of genetic information in life, consists of a long chain of deoxyribose-containing units called nucleotides, linked via phosphate groups



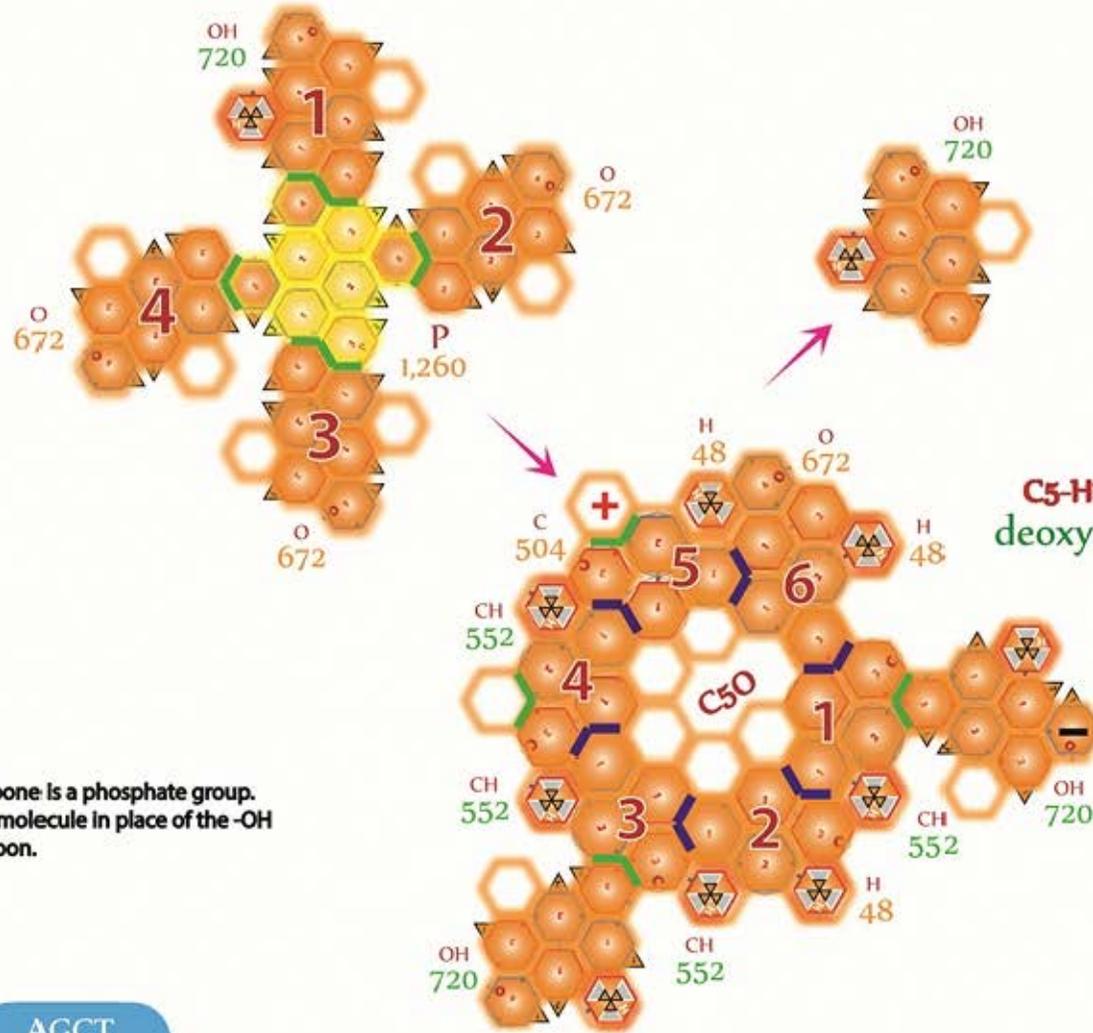
Hermann Emil Fischer won the Nobel Prize in Chemistry (1902) for his work in determining the structure of the D-aldohexoses.

However, the linear, free-aldehyde structures that Fischer proposed represent a very minor percentage of the forms that hexose sugars adopt in solution. It was Edmund Hirst and Clifford Purves, in the research group of Walter Haworth, who conclusively determined that the hexose sugars preferentially form a pyranose, or six-membered, ring. Haworth drew the ring as a flat hexagon with groups above and below the plane of the ring – the Haworth projection

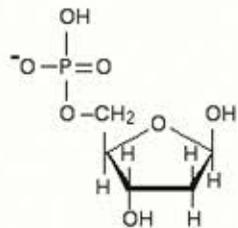


Phosphorus

3,996
[1,998-1,998]

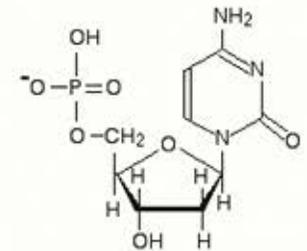
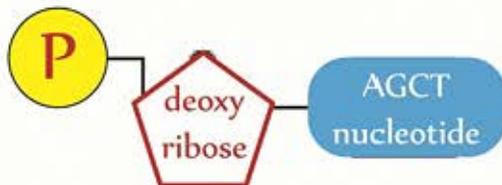


HPO₄
phosphate
group



C₅H₁₀O₄
deoxyribose

The other repeating part of the DNA backbone is a phosphate group. A phosphate group is attached to the sugar molecule in place of the -OH group on the 5' carbon.



5,688
[2,844-2,844]

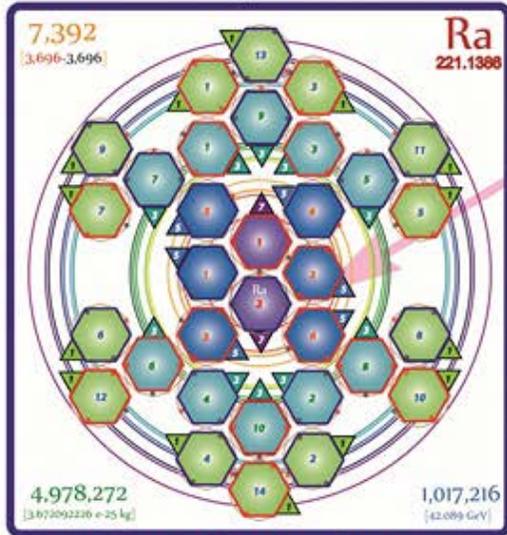


Radioactive Decay

The Atom releases excess energies in various forms as it seeks a lower energy, state of equilibria with its surrounding EM energy environment

Energy in all its forms seeks equilibrium

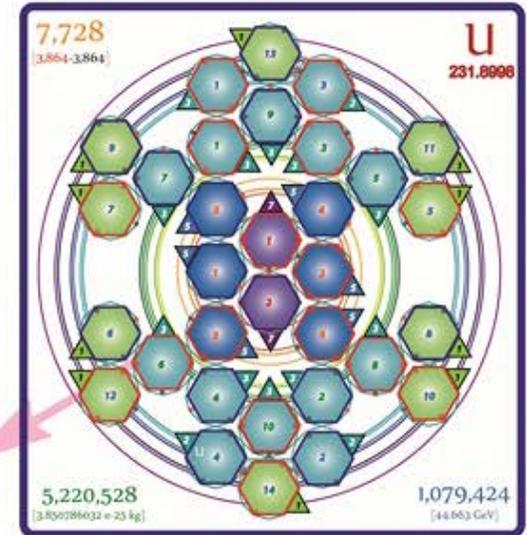
Photons, Heat, Vibration & Kinetics can all raise the energy levels of atomic nuclei



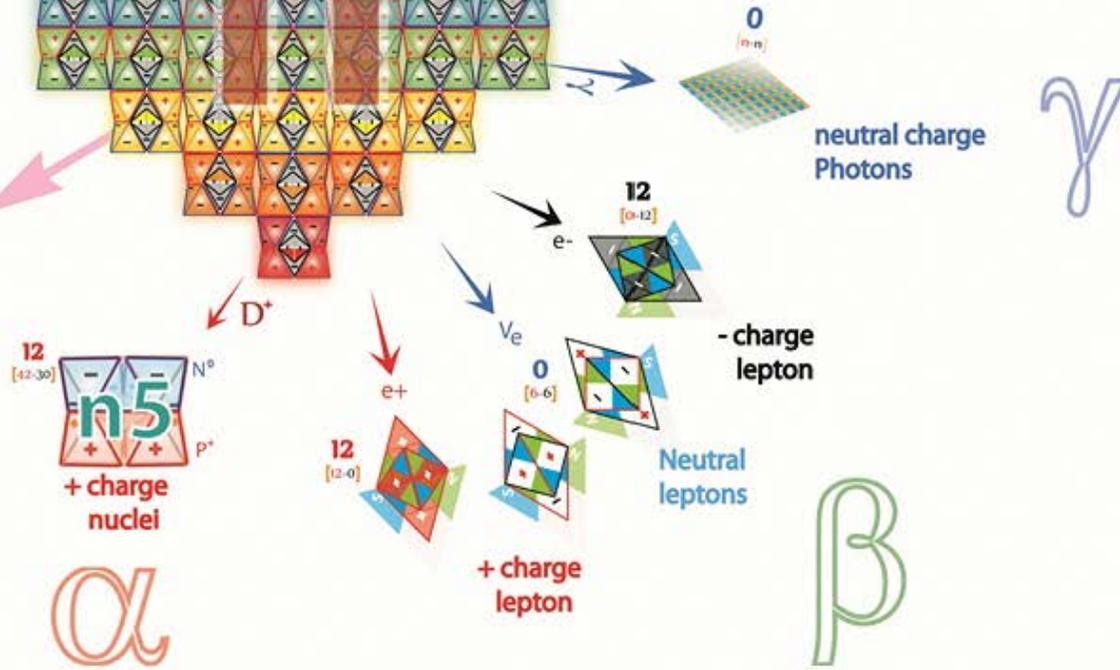
stable core electron configurations

The spectral line emissions of photons from bound electrons in addition to Alpha, Beta and Gamma Particle emissions from nuclei can release KEM energies over long time spans

E
scalar equilateral
mass-**ENERGY**-Matter
geometries topologies
 mc^2 Mc^4

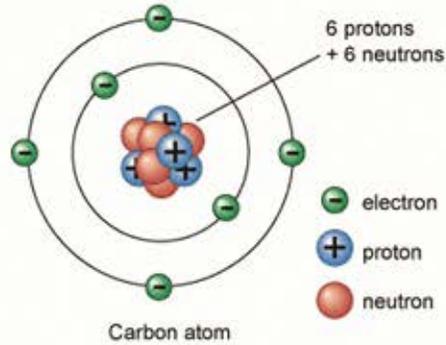


unstable high energy nuclei



Radio-Carbon isotope dating

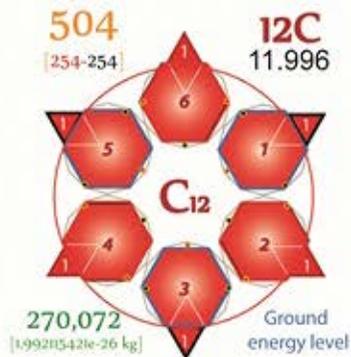
Radiocarbon dating (sometimes simply known as carbon dating) is a radiometric dating method that uses the naturally occurring radioisotope carbon-14 (^{14}C) to estimate the age of carbon-bearing materials up to about 58,000 to 62,000 years



[6 Deuterium nucle]

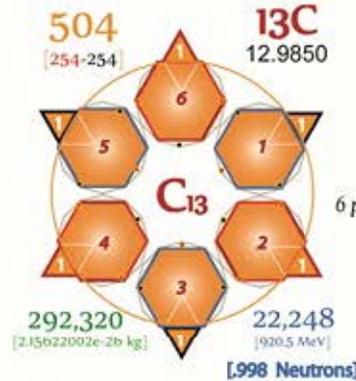
ALL elemental Carbon atoms have an atomic configuration of 6 protons, 6 neutrons and 6 electrons

Radio-Carbon dating can be used to determine the age of carbonaceous materials up to about 60,000 years old



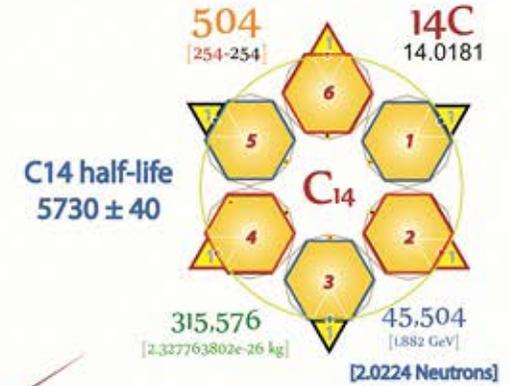
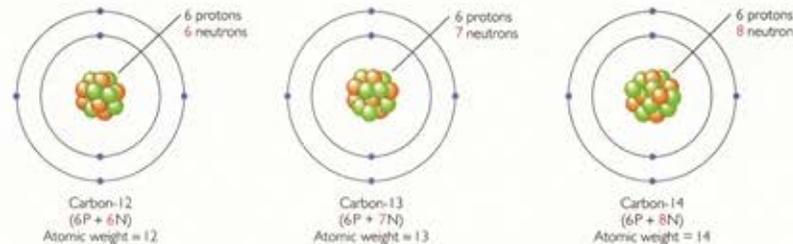
Standing-wave KE not 'excess' Neutrons

It is the stored Kinetic Energies [KE] that increase the mass of Carbon12 to create its isotopes, historically these mass-energies have been mistakenly thought to be extra Neutrons in the nuclei

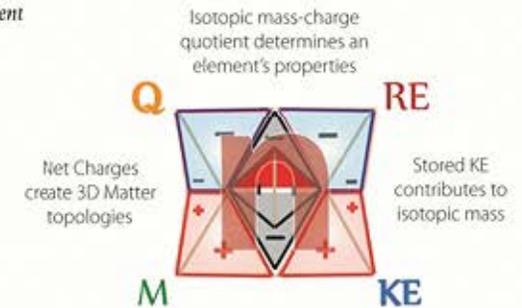


Carbon-13, ^{13}C , is a weakly radioactive isotope of carbon with a nucleus containing 6 protons, 6 neutrons and 6 electrons with an excess energy content of 920 MeV

Tetryonic theory corrects historical errors of atomic geometries and nuclear energies



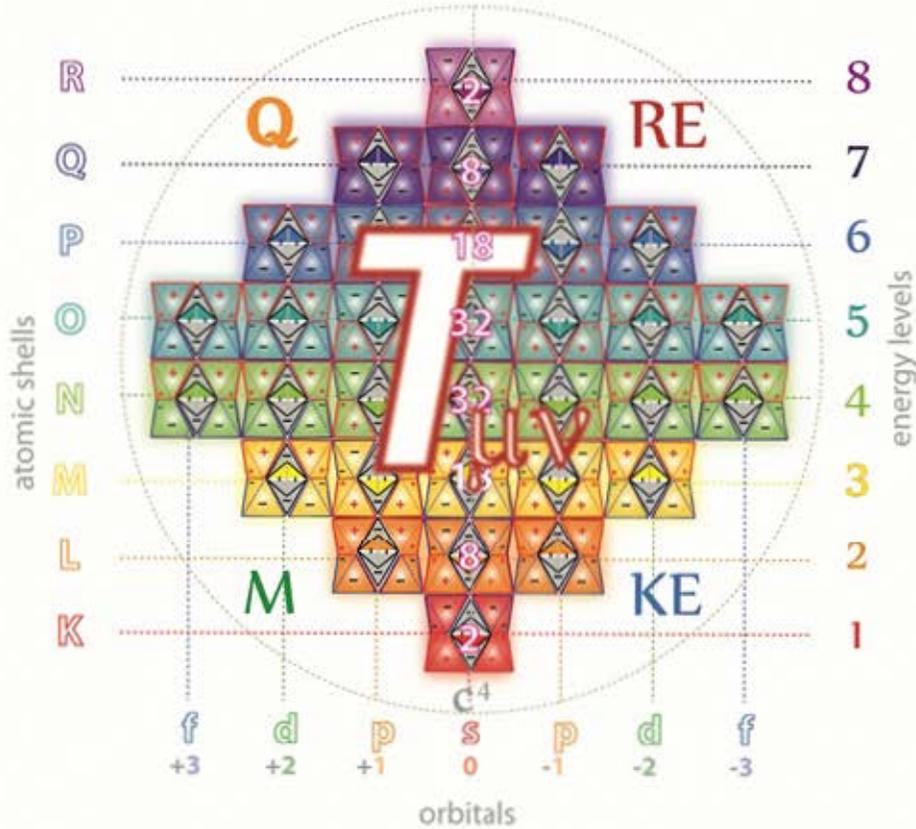
Carbon-14, ^{14}C , or radiocarbon, is a radioactive isotope of carbon with a nucleus containing 6 protons, 6 neutrons and 6 electrons with an excess energy content of 1.88 GeV



The stored KE [chemical] mass-energies of the Carbon 12+ isotopes comes from various radiological [and biological] processes and its steady, predictable release through the quantum mechanics of the synchronous convertors that make up Carbon nuclei make it useful in dating objects based on their decay rates

Radioactive Isotopes

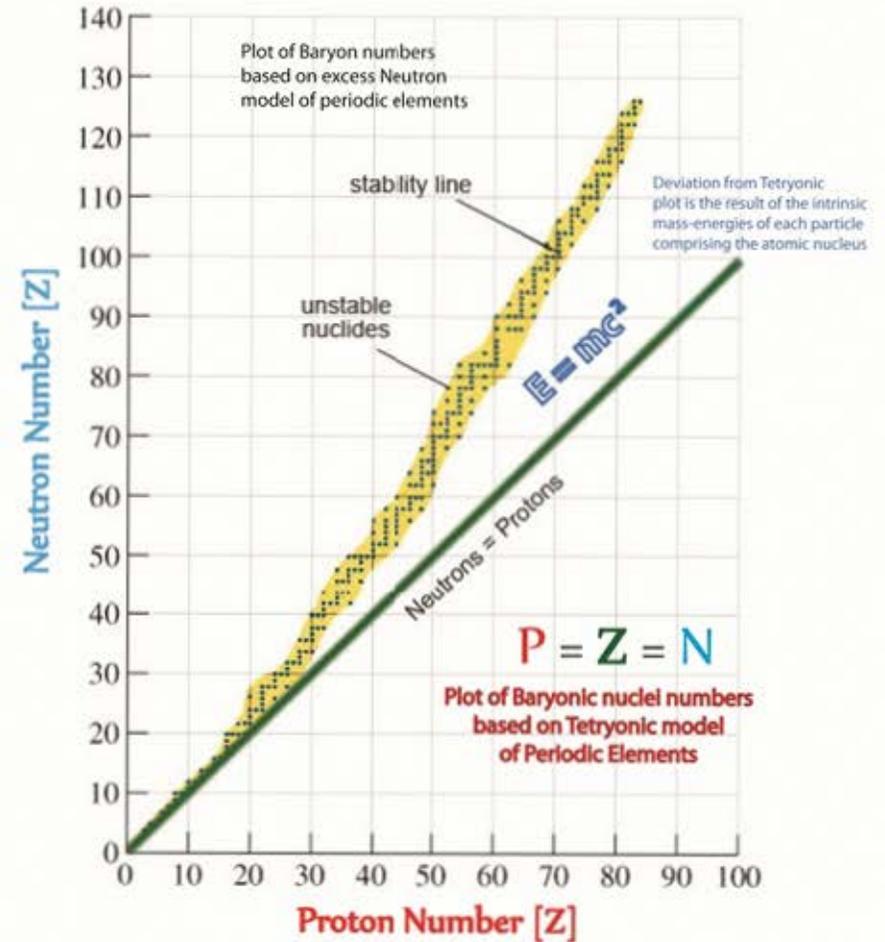
Where the elementary nuclei's Deuteron energy levels are raised from their ground levels radioactive isotopes are created



Each periodic element is comprised of an EQUAL number of Protons, Neutrons & electrons that form each element's unique 2D mass-energy geometries & 3D Matter topology and contribute to its observed properties

The $\frac{\text{mass}}{c^2} \sim \frac{\text{energy}}{c^4}$ content of Matter

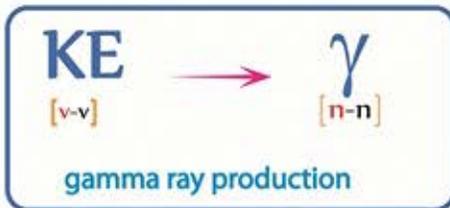
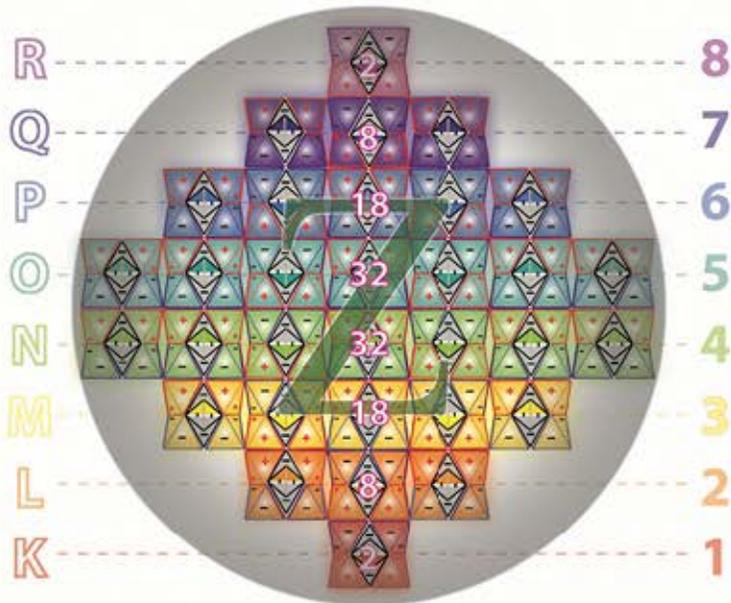
Einstein's relativistic stress energy tensor models mass-energy-Matter as a nebulous energy-momenta density-pressure gradient



Tetryonic theory redefines the relativistic stress energy tensor $[T_{\mu\nu}]$ into a geometric measure of the charged 2D electromagnetic mass-energies & 3D Matter topologies within any spatial co-ordinate system

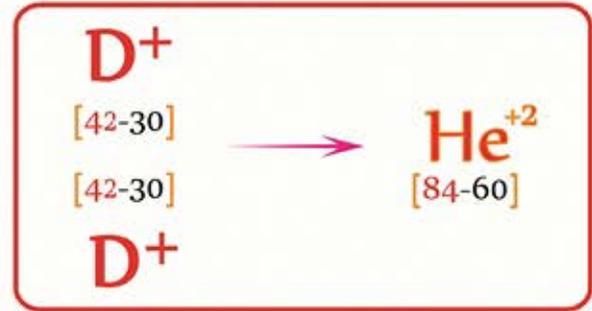
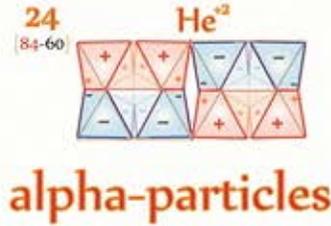
Nuclear Decay processes

is the set of processes by which an unstable atomic nucleus emits subatomic particles



Charge & mass-energy momenta are conservative physical properties

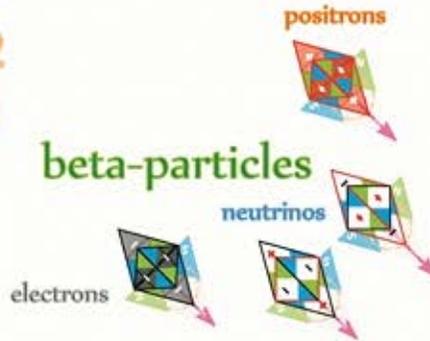
Radioactivity was discovered in 1896 by the French scientist Henri Becquerel, while working on phosphorescent materials. These materials glow in the dark after exposure to light, and he suspected that the glow produced in cathode ray tubes by X-rays might be associated with phosphorescence



Energy can be released from atomic nuclei through various processes

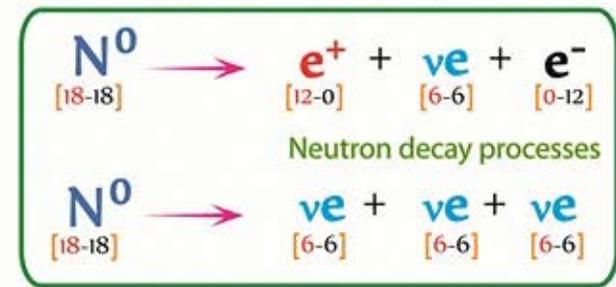
- alpha-particles
- beta-particles
- gamma rays
- spectral lines
- heat & motion

E



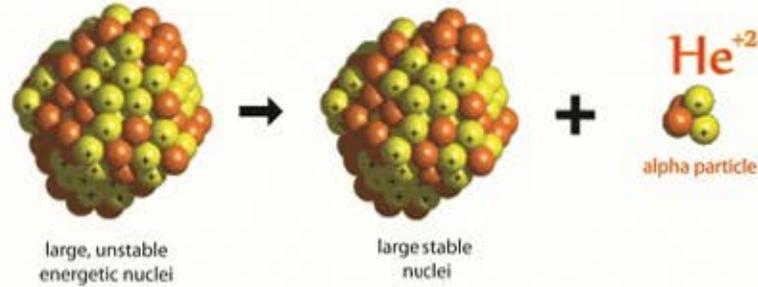
m All nuclear decay particles are determined by M Tetryonic charge topologies

Charge Matter particle creation follows chemical equilibrium formulae

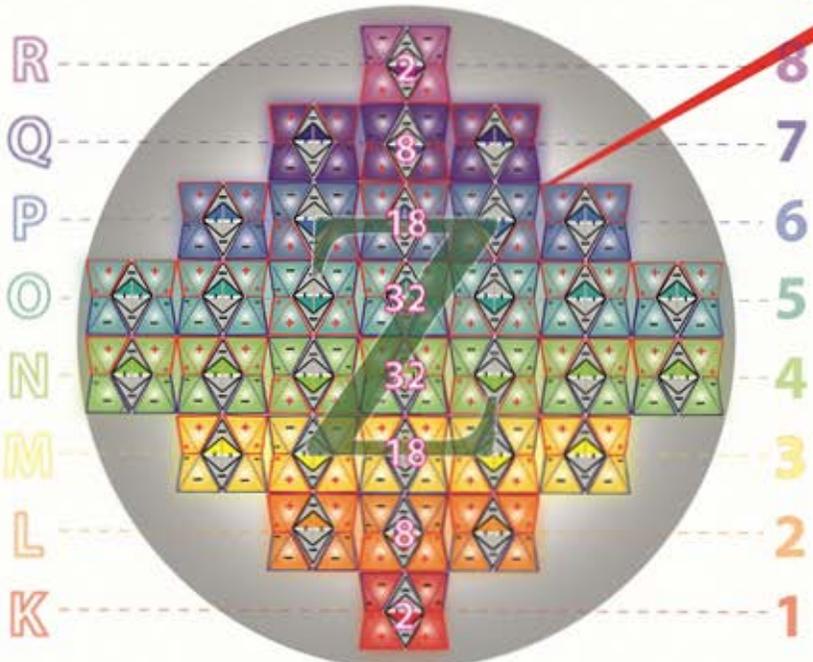


3D Matter topologies are not conservative

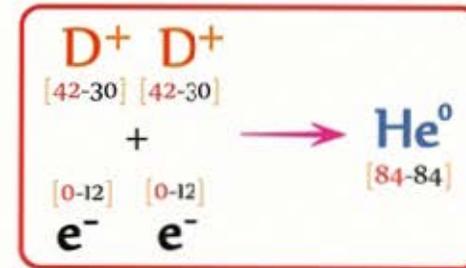
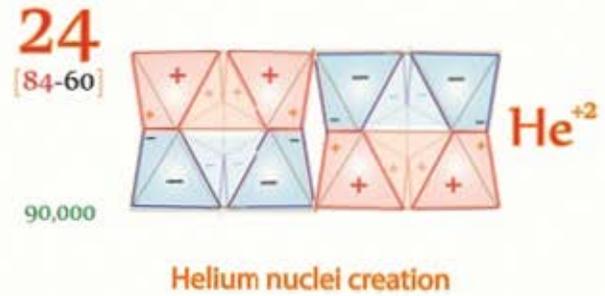
Alpha radiation (Deuteron emissions)



Alpha particles are released during alpha decay processes in ultra-heavy nuclei like uranium, thorium, actinium, and radium

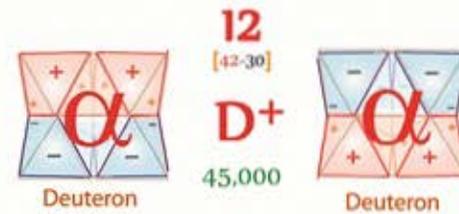


Beta radiation - Negative charge sets (Nuclei)
Gamma radiation - Neutral Charge sets (Photons)

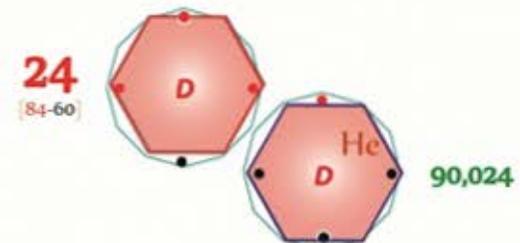


charged alpha nuclei bond & capture electrons to form neutral Helium

alpha particles

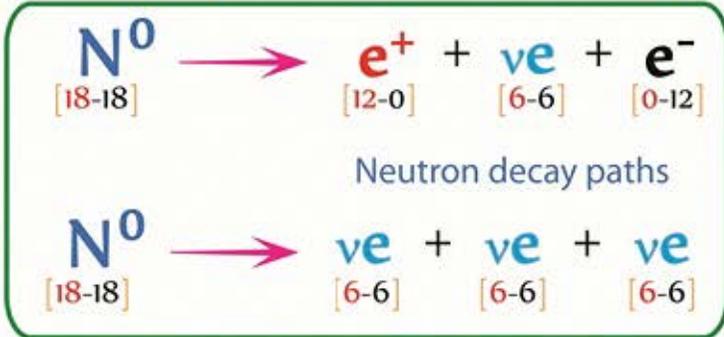


The radioactive isotope Americium 241 emits alpha particles which are used in smoke detectors.

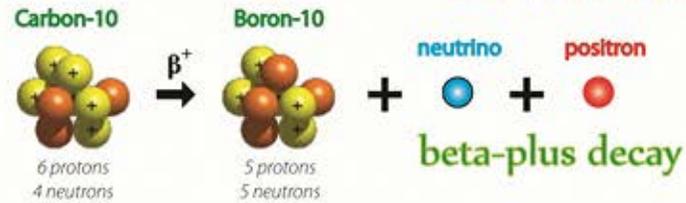
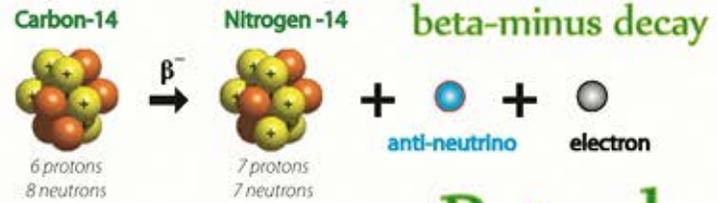


Due to their larger masses compared to beta and gamma particles, alpha particles can be easily stopped by a piece of paper or human skin.

Beta particle decay

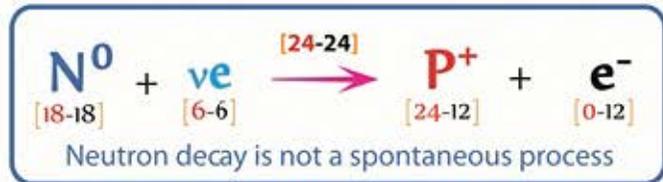


(the emission of leptons from atomic nuclei)

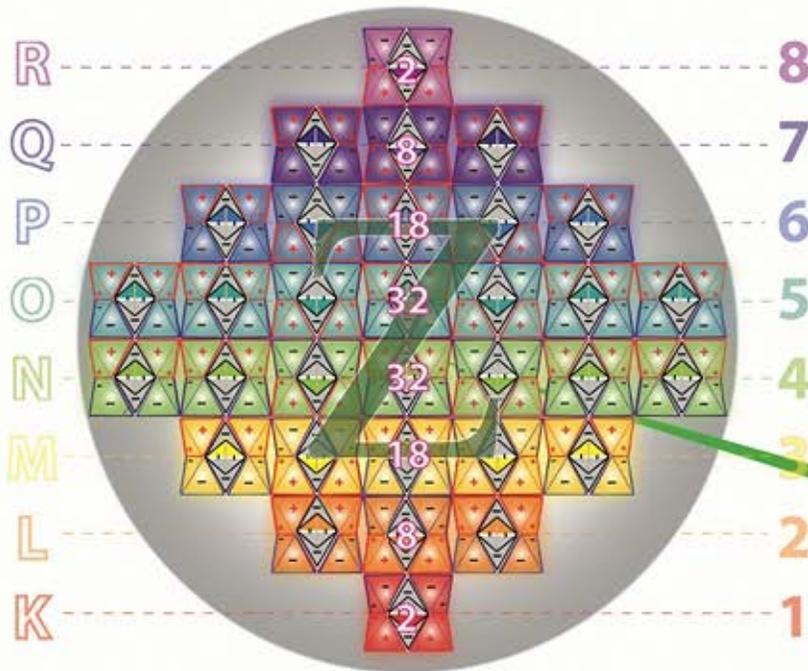


Beta decay

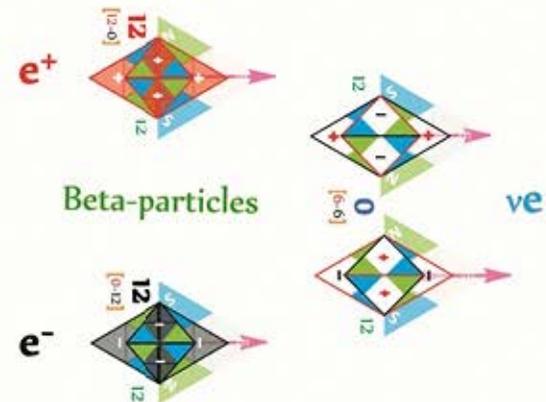
Charge is a conserved physical property of all material objects



All beta decay processes are the result of neutrino interaction with Neutrons



Alpha radiation - Positive charge particles (Nuclei)
Gamma radiation - Neutral charge quanta (Photons)



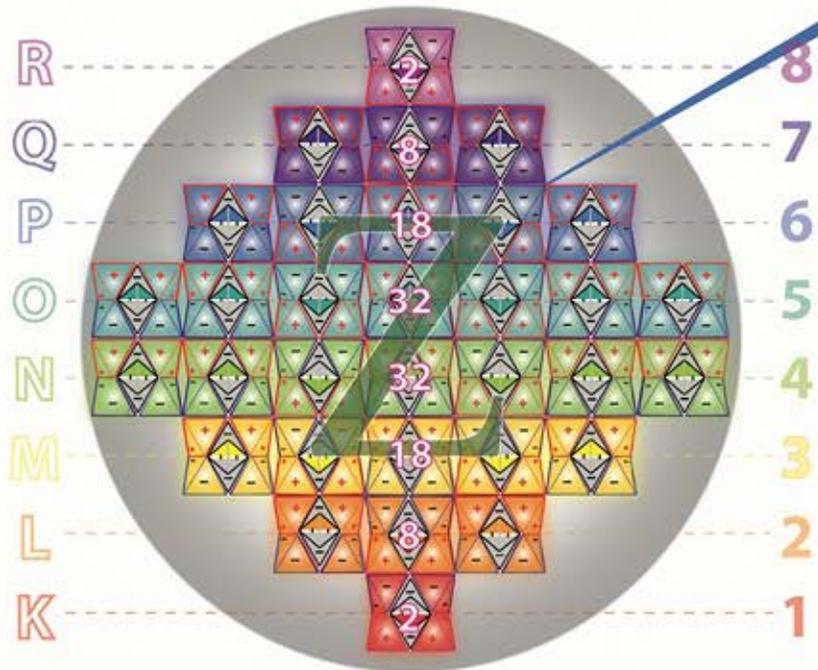
Gamma Radiation

(high energy photon emission)

Natural sources of gamma rays on Earth include gamma decay from naturally occurring radioisotopes, and secondary radiation from atmospheric interactions with cosmic ray particles.

All ejected gamma ray photons are neutral energy quanta sets [photons / EM waves]

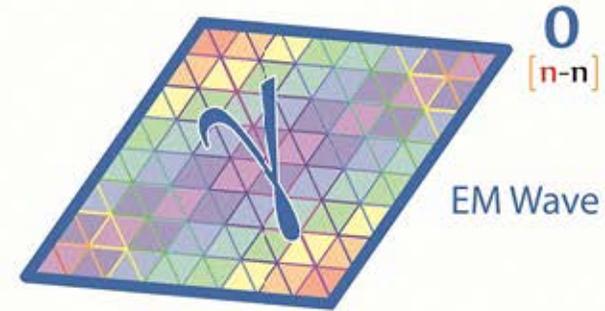
Gamma rays typically have frequencies above 10 exahertz (or $>10^{19}$ Hz), and therefore generally have energies above 100 keV and wavelengths less than 10 picometers (less than the diameter of an atom)



Alpha radiation - Positive charge particles (nuclei)
Beta radiation - Negative charge particles (leptons)

gamma rays

Gamma decay produces rays with energies of only a few hundred keV, and almost always less than 10MeV



$$2\pi \left[\begin{matrix} \text{EM Field} \\ \text{Photons} \end{matrix} \left[\begin{matrix} \epsilon_0 \mu_0 \\ \text{ElectroMagnetic} \end{matrix} \right] \cdot \left[\begin{matrix} \text{Planck quanta} \\ m \Omega v^2 \\ \text{mass velocity} \end{matrix} \right] \right]$$

Gamma rays are a form of ionizing radiation, and they have very good penetrating power. They result from the release of atomic energies and will cause biological damage to living tissue.

$$2h\nu = E = hf$$

Care must always be taken to distinguish between charged Planck quanta $[\nu]$ and photons $[f]$

gamma ray bursts

Baryon mass-Matter topology

gamma ray mass-energy geometry

$$N^0 \rightarrow [2.25 \text{ e}23]$$

$[18-18] \quad \rightarrow \quad [v-v]$

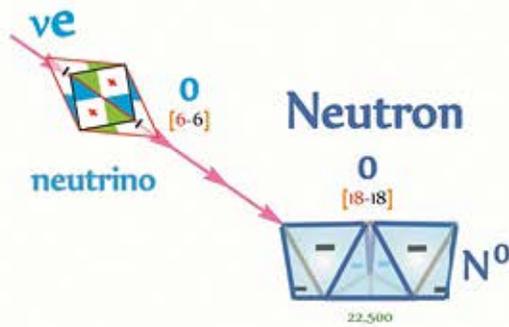
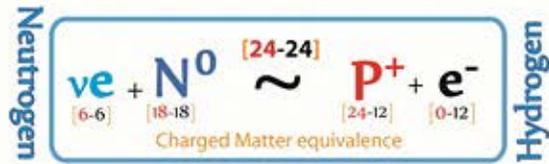
$$E = 2mc^2 = hf$$

930 MeV

930 MeV

are the result of the stored KEM mass-energies of Matter topologies being released as mass-energy momenta geometries

neutrino-Neutron Interactions



neutrino capture

Neutron decay is not the spontaneous process hypothesised by modern nuclear physicists

The observed decay products are the result of solar neutrinos interacting with Neutrons (both within nuclei and free)

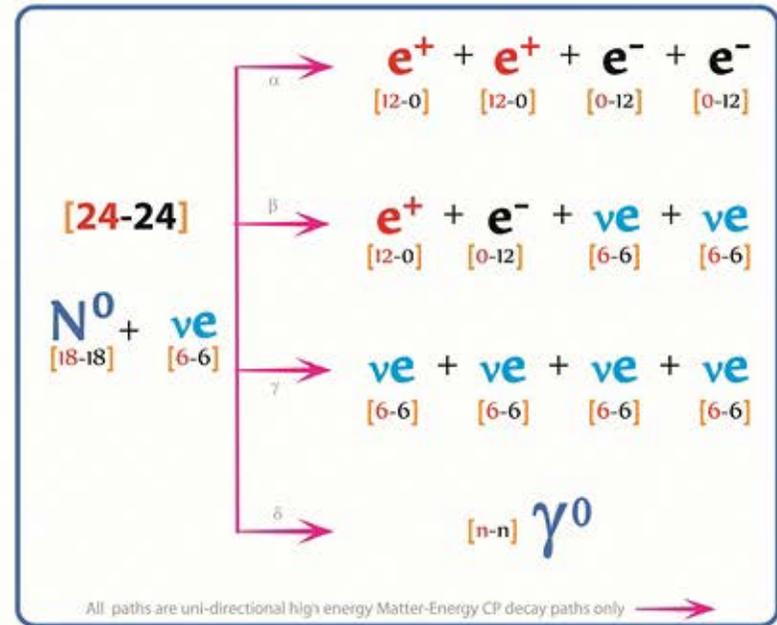
the neutrinos also have an equally likely probability of interacting with Protons in the nuclei

[24-24]
A Neutronium atom has an identical mass-charge quotient to that of Hydrogen **[24-24]**

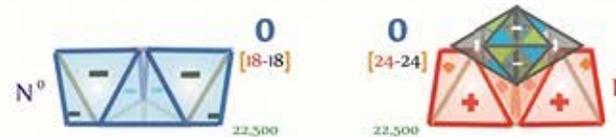
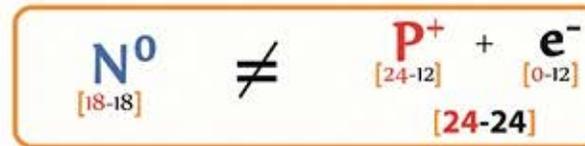


Neutronium decay processes

A Neutron/neutrino interaction can decay into 4 differing particle sets



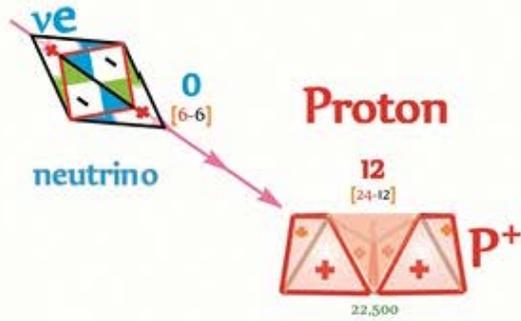
Excluding their nett Charge, Neutrons have neutral particle geometries [18-18] identical to that of a Proton [24-12]



Spontaneous Neutron decay into Proton-electron-neutrinos is not possible without the interaction of Muonic neutrinos (see Tetryonic Charge numbers)

A Neutron is NOT a Proton that has absorbed an electron

neutrino-Proton Interactions



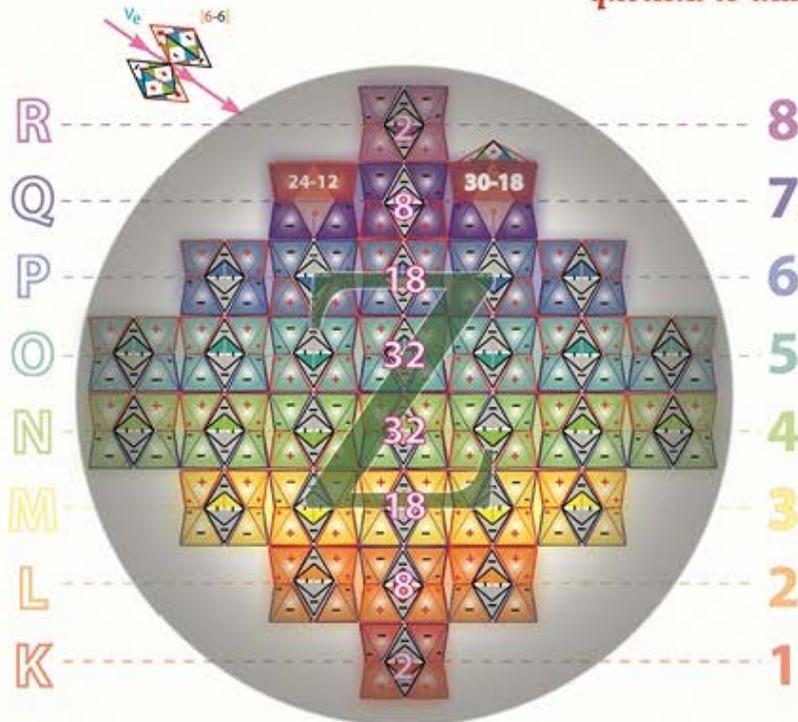
neutrino capture
Neutron decay is not the spontaneous process hypothesised by modern nuclear physicists

The observed decay products are the result of solar neutrinos interacting with Neutrons (both within nuclei and free)

the neutrinos also have an equally likely probability of interacting with Neutrons in the nuclei

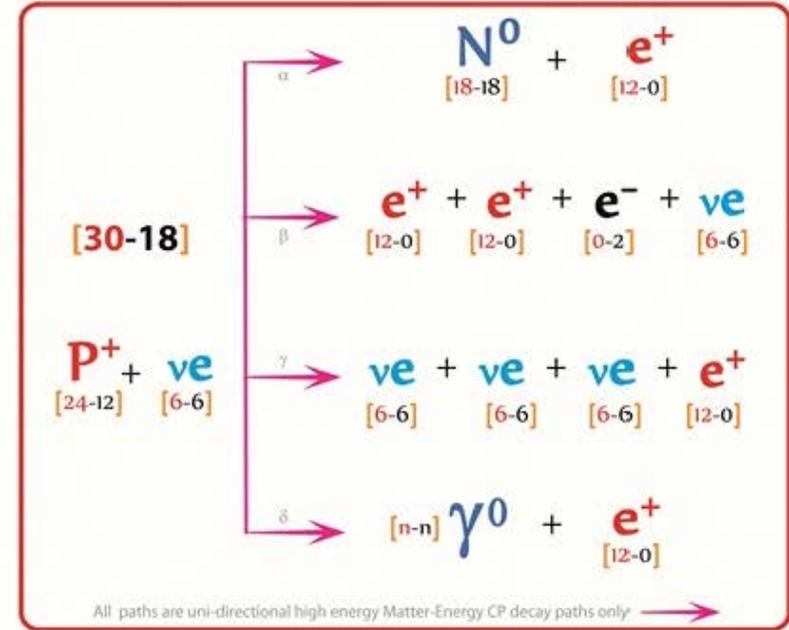
Although very weakly interacting, neutrinos can still be attracted to and bind to Protons via their negative charge fascia

[30-18]
A Proton-neutrino atom would have an identical charge quotient to that of a Proton
[24-12]



Proton decay paths

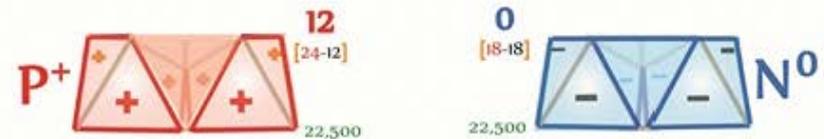
A Proton/Neutrino interaction can decay into 4 differing particle sets



All paths are uni-directional high energy Matter-Energy CP decay paths only

If they exist, Proton-neutrino particle couplings would function in a manner identical to that of Proton-electron couplings and could be detected by the anomalous spin measurements that would result

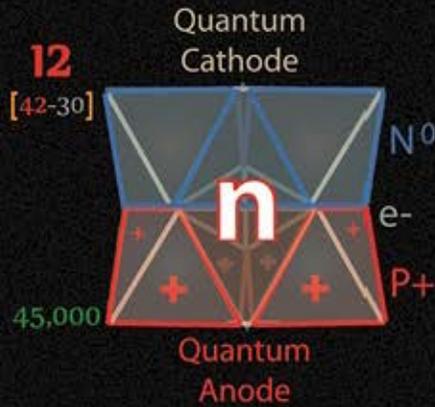
A Proton has a Positive charge geometry [24-12] equivalent to that of a Neutral Neutron [18-18]



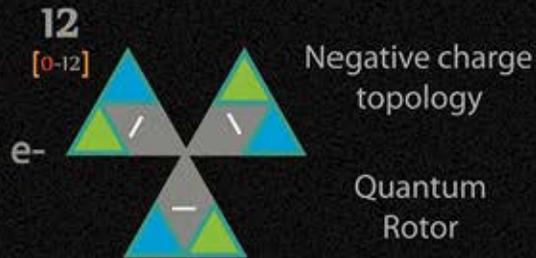
A Proton is topologically identical to a Neutron (differing only in the net charge created)

Quantum Batteries

Atomic nuclei can be easily scaled to non-quantum sizes to offer clean, safe and portable long term Energy storage devices that can store energy indefinitely and release it on demand anywhere in the World

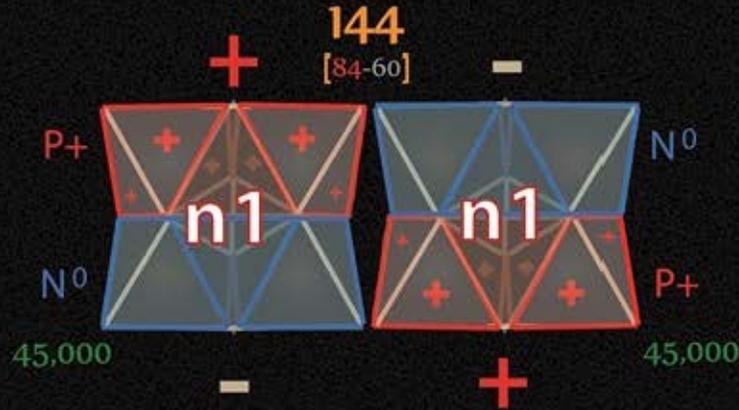


The quantum battery is unique in that in addition to storing energy indefinitely, when an electron binds to the Deuteron nuclei it has the ability to release specific energies [photons] by way of its quantum-scale synchronous converter topologies



12 loop quantum inductive rotor

(Atomic Nuclei)

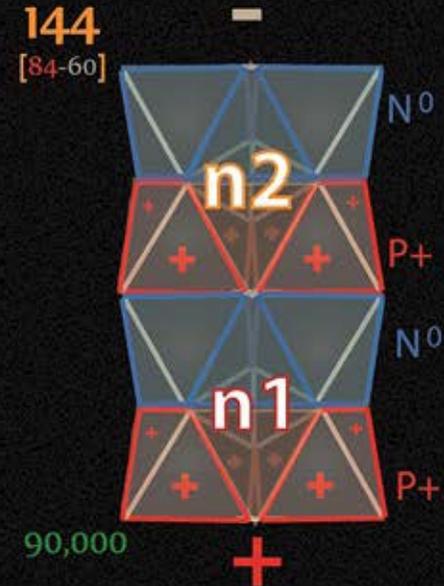


anti-Parallel Configuration



Synchronous quantum converter topologies can be connected in parallel or series to meet varying power requirements anywhere in the World and provides for the safe storage of nuclear energy as mass

Series Configuration



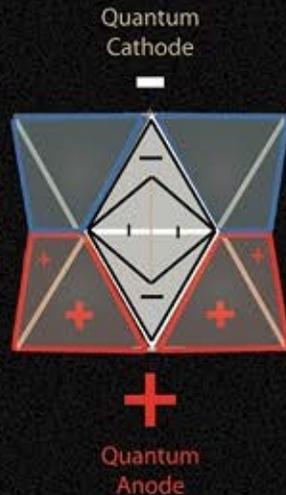
Quantum synchronous Converters

Energy can be stored in macro-scaled quantum converters as mass

The electron has a charged Tetryonic Matter topology that is electrically equivalent to a 6 loop inductive rotor

$$\frac{12\pi}{c^4} \left[\begin{matrix} \text{Energy} \\ \text{Planck quanta} \\ \text{mass} \end{matrix} m \Omega v^2 \right] \begin{matrix} n8 \\ n1 \end{matrix}$$

momenta



Matter is radiant EM energy in a standing-waveform

$$\frac{72\pi}{c^4} \left[\begin{matrix} \text{Energy} \\ \text{Planck quanta} \\ \text{mass} \end{matrix} m \Omega v^2 \right] \begin{matrix} n32 \\ n25 \end{matrix}$$

momenta



Building on the charged topology of Deuterium nuclei, scaled electromechanical quantum converters can be manufactured to provide efficient electrical mass-energy storage & distribution devices

$$\frac{84\pi}{c^4} \left[\begin{matrix} \text{Energy} \\ \text{Planck quanta} \\ \text{mass} \end{matrix} m \Omega v^2 \right] \begin{matrix} n32 \\ n25 \end{matrix}$$

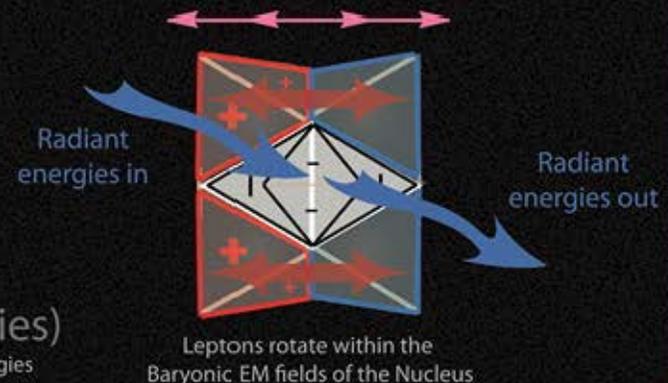
momenta

These devices can be transported any where demand requires them worldwide with their energies stored in the form of mass

Negating the need for centralised power stations and distribution lines extending vast distances to provide power to remote communities

A quantum synchronous converter can store and release 3 forms of energy

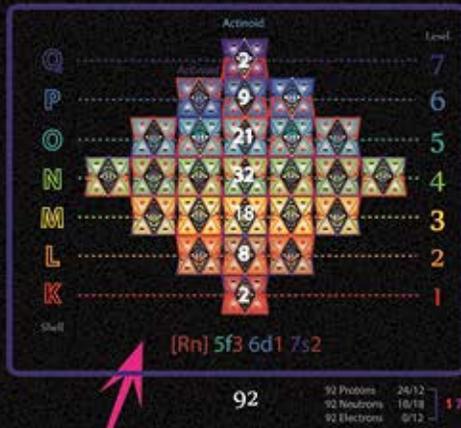
- Angular Momentum** (motional energy)
square root linear momentum
- Radiant Energy** (emission/absorption)
of photon/boson mass-energy geometries
- EM mass-Matter** (stored masses in Matter topologies)
radiant EM mass-energies stored in standing wave Matter topologies



Nuclear Fission

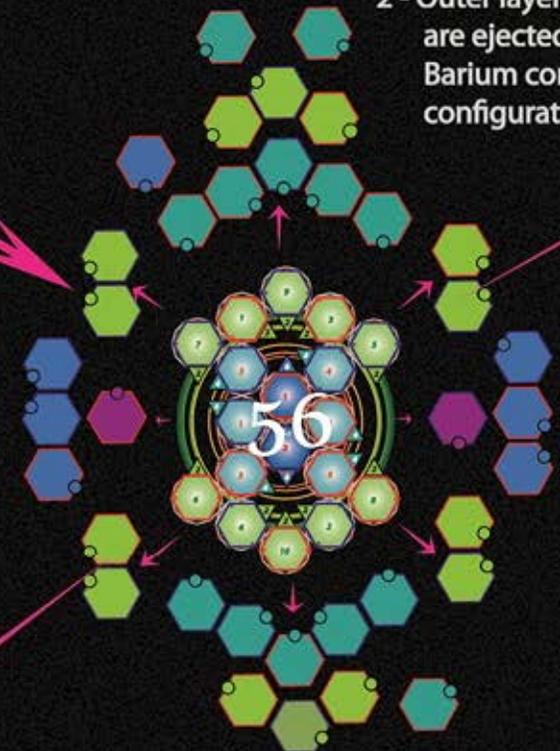
Fission is a currently known source of nuclear energy for human consumption with an efficiency of less than 1%

Its energy output can be easily exceeded with cold fission & EM pinch technologies without any of the harmful nuclear by-products

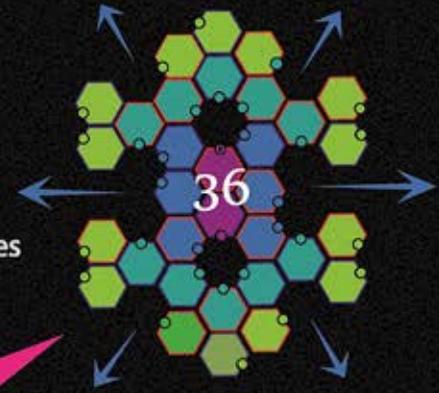


Uranium

1 - A Slow Neutron with >0.4eV of [K]EM energy interacts with a unstable Uranium nuclei raising its quantum levels

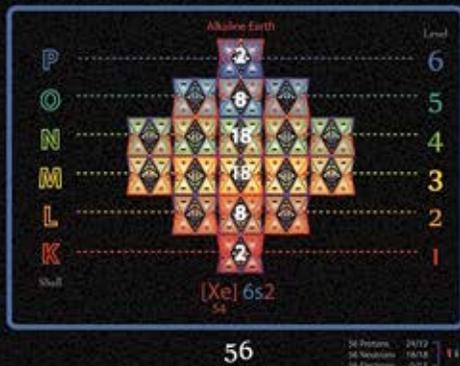


2 - Outer layer of alpha particles are ejected from inner Barium core electron configuration



3 - Remaining Bayonic cloud releases excess energy and recombines to form Nuclei

4 - Barium cores and recombined Krypton cores form Decay products



Barium

Energy Released

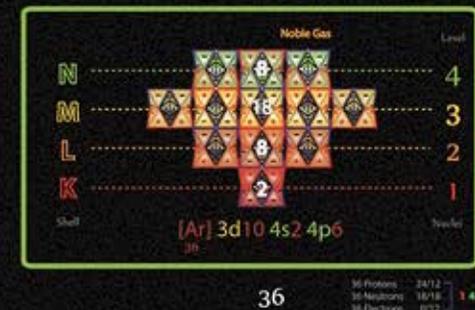
U Ba Kr

[1,079,424] - [534,240 + 255,744]

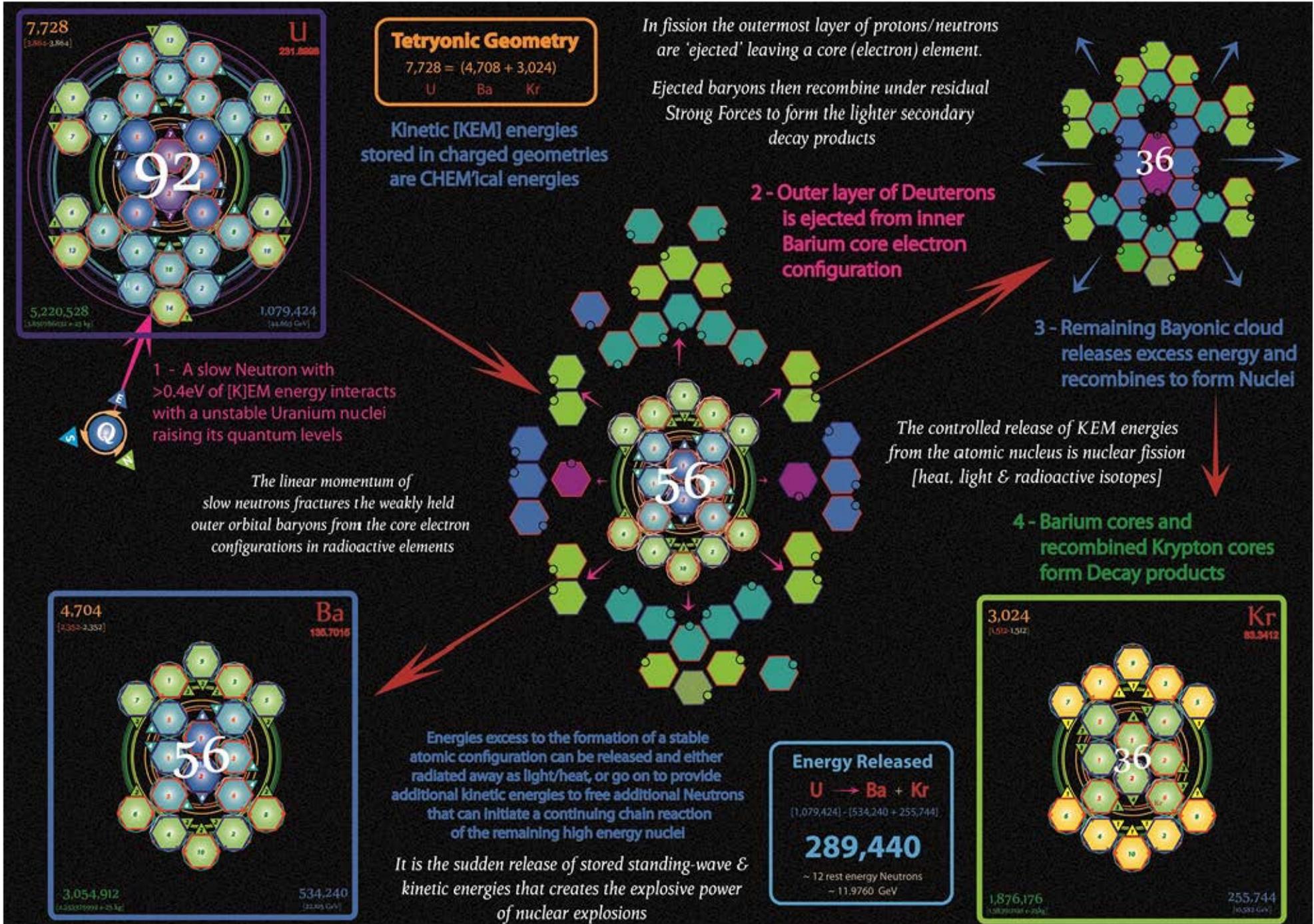
289,440

~ 12 rest energy Neutrons

~ 11.9760 GeV



Krypton



Tetryonics 60.13 - Nuclear Fission process



The production of light as a result of the passing of sound waves through a liquid medium.

The sound waves cause the formation of bubbles that emit bright flashes of light when they collapse.

Sonoluminescence

Sonoluminescence is the first hint at the energies that can be released from Tetryonic collapse and involves the emission of short bursts of light from imploding bubbles in a liquid when excited by sound.

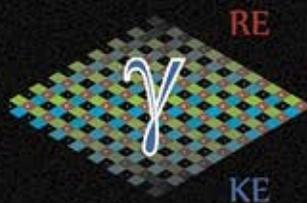
It is a key step on the road to realising technologies that can provide Humanity with clean, safe, efficient Energy production through the conversion of Matter Into various forms of EM radiation

Sonoluminescence is the result of energy releases from the collapse of standing-wave Matter topologies within Fluids

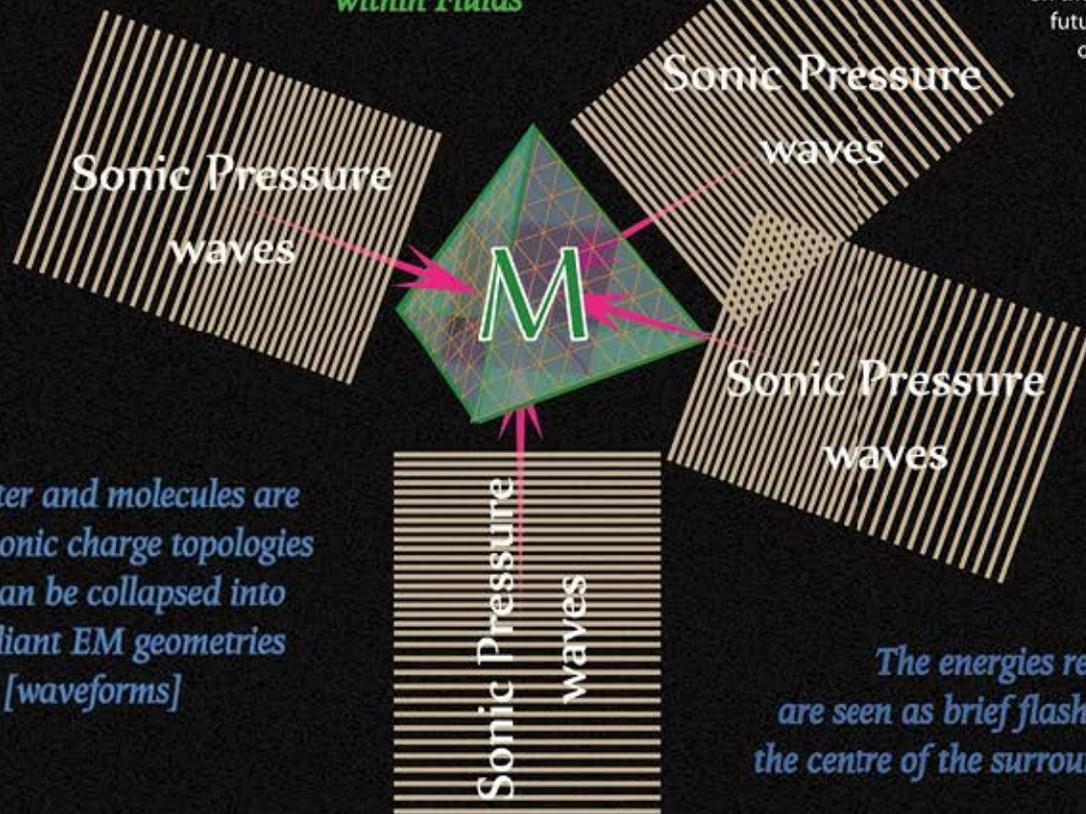
Finding an efficient means of inducing and managing a controlled reaction where 3D Matter topologies are converted into 2D radiant energy is a key step on the path to creating a future energy source of all Humanity



The gauge transformation of Matter into EM radiation is the most efficient form of energy release available to us



All Matter and molecules are 3D Tetryonic charge topologies which can be collapsed into 2D radiant EM geometries [waveforms]



The energies released are seen as brief flashes of light at the centre of the surrounding medium

Stanley Pons Martin Fleischmann



(23 August 1943) (29 March 1927 – 3 August 2012)

'Nuclear fusion of the type postulated would be inconsistent with current understanding and, if verified, would require theory to be extended in an unexpected way'

Palladium's rest molar mass is 108.7867 with a stored Kinetic energy content of 15.699 GeV [16 neutron equivalence]

Cold Fission



Atomic nuclei can easily release the reported energies without Neutron particle emissions when an accurate model of the atomic nuclei is used



'Fusion' is a fictitious nuclear process 'cold fusion' is in fact a form of nuclear fission



The reported excess energy released is often refused as being impossible as it would require the release of massive neutron radiation bath.

Expelling the non-core atomic nuclei results in a release of stored KEM energies as the deuterium nuclei seek to reach a ground energy level state

Krypton's rest molar mass is 83.3412 with a stored Kinetic energy content of 10.582 GeV [11 neutron equivalence]

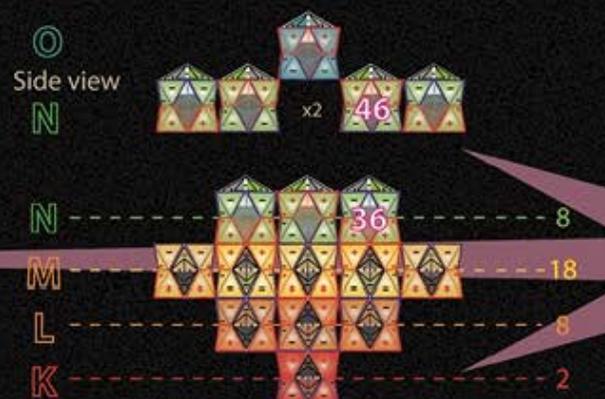
3,864
[1,932-21,932]

Pd
108.7867

378,432
[15.699 GeV]

2,448,984
[1,806,429,039 e-23 kg]

Palladium



2 x n5
10 Deuterons
8 x n4

}

122,688
[5.076 GeV]

Energy equivalent to 5+ Neutrons

NO excess Neutrons are ever released
~ only stored KEM energies and alpha particles

3,024
[1,512-1,512]

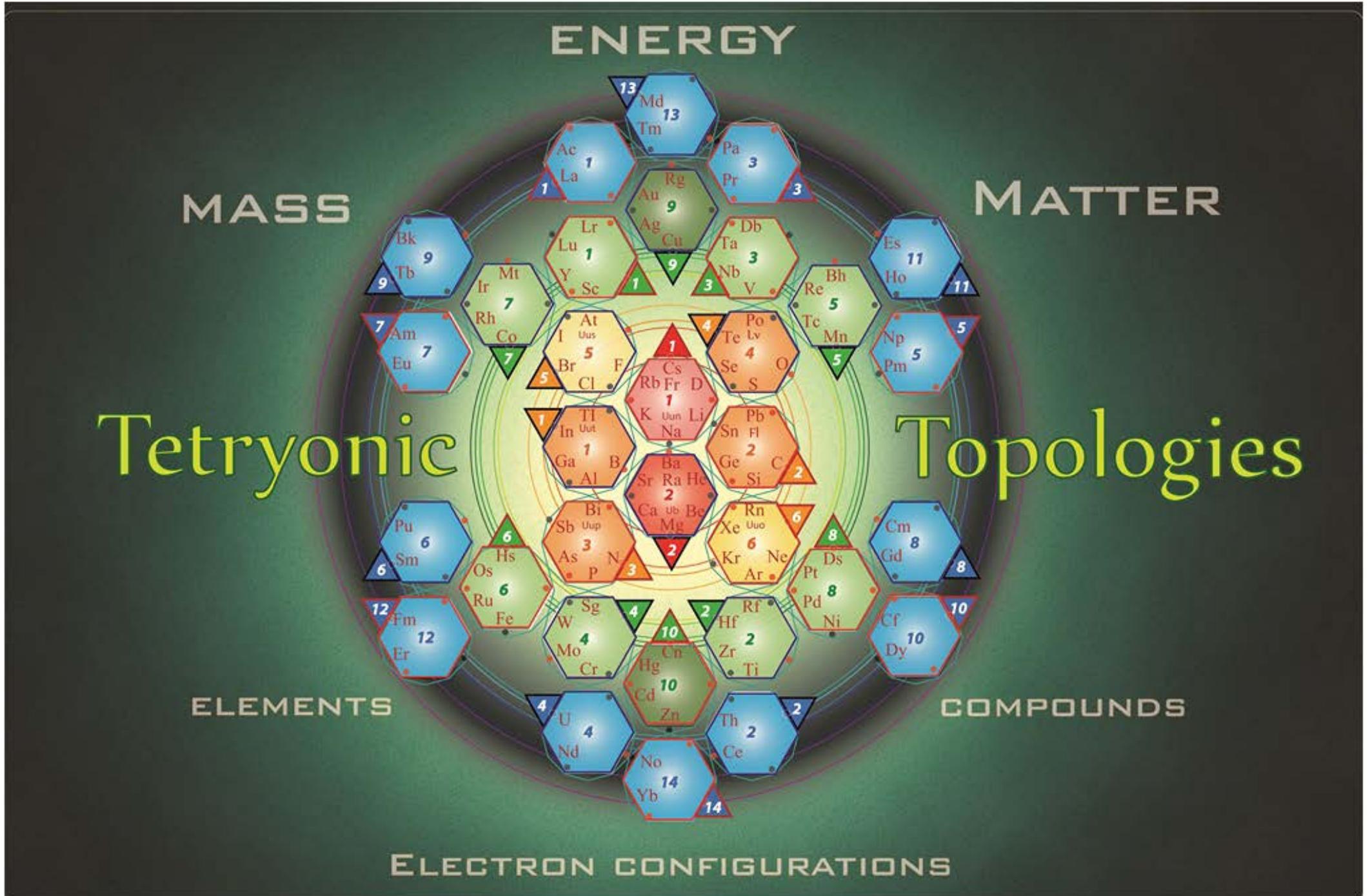
Kr
83.3412

255,744
[10.582 GeV]

1,876,176
[1,383,912,890 e-23 kg]

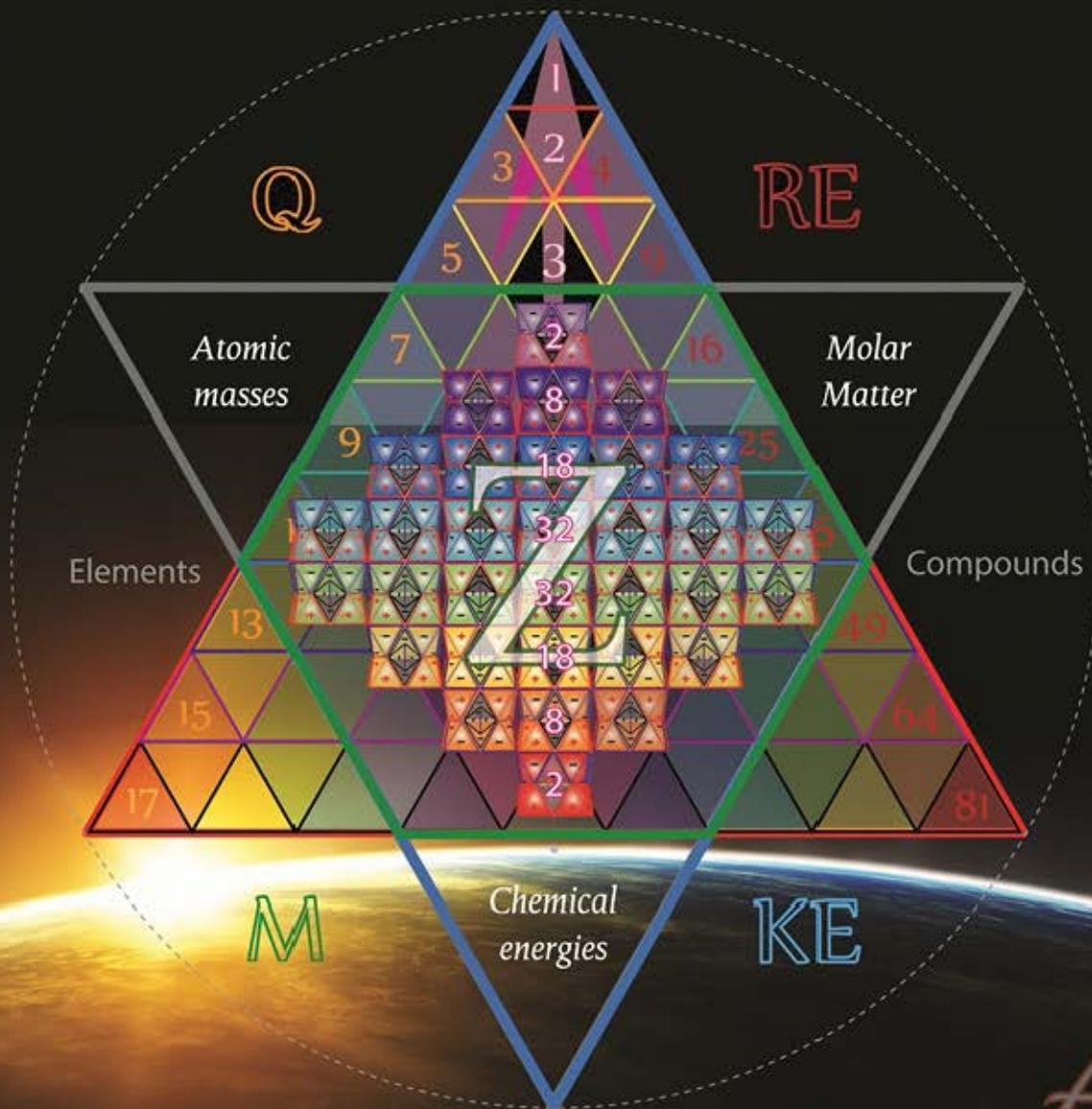
Krypton

[Ar] 3d10 4s2 4p6 Noble Gas 36 Protons 24-12 36 Neutrons 18-18 36 Electrons 0-12 14



Tetryonic Chemistry

The charged topology of periodic and compound Matter



ISBN 978-0-987288-3-1
[Second Edition © 2012]

Abraham