

BUILDING ELEMENTS, PERIODIC TABLE AND FORCES IN RELATION TO THE UNIVERSE CYCLE:

- In **F1a document 2014** higgs.string.elementary.particlemodel www.uiterwijkwinkel.eu the author describes that the energetic general common relative steady state there is only and universe wide:
 - Two uniform super symmetric higgs particle / strings of the (anti) proton and
 - Two uniform super symmetric higgs particle / strings of the (anti-) electron.
- Those four higgs particle apply to about 99.99% or more of all existing higgs in the universe.
- In short they are higgs. These four higgs generate only four elementary features: 1) space, 2) (anti) mass, 3) electric charge and 4) magnetic spin by kinetic energy in rotation movements.
- The remaining 0.01% of the higgs is in an energetically extreme condition only temporarily found in collisions in particle accelerators and during nuclear (fusion) reactions.
- These pairs of higgs/strings are frankinos, (half-) photons of infrared (the proton) and that of light to form (the electron). Thus to make his than constructions of $13\frac{1}{2}$ photons with already the physical characteristics of the proton or electron with respect to mass, charge and spin but without the trait of (anti)matter. In order to obtain these characteristics of (anti)matter first $E = \frac{1}{2} mc^2$ must be added to rotational energy of these constructions of photons. **F1c document**.
- By passage through electric and magnetic fields of stars and galaxies those constructions $13\frac{1}{2}$ photons accelerating rotating their axis up to the speed of light and so $E = \frac{1}{2} mc^2$ is added to rotational kinetic energy. Then those 'rotor photons' transform into the (anti) proton or the (anti) electron with the characteristic of (anti) matter. See **document F1c**.
- Unlike mass and anti mass equivalent matter and anti matter can annihilate. Thereby $E = mc^2$ as rotational energy transforms into free photons. *During annihilation mass is not converted into energy!* Apparently it seems that to happen. All emitted photons are Majorana particles, in short majoranas; real particles with a measurable mass, charge and spin of quantitatively substantially zero and with dipole forces and quadrupole ones. See **document F1b**.
- The (anti)proton and the (anti-)electron are the only possible stable four building blocks in universe:
 - a) of all the common atoms of the periodic table,
 - b) of all anti atoms (anti hydrogen alone) and
 - c) of all the atoms in a black hole state. (These are ordinary isotopes whose electron-shells are collapsed to just near the nucleus. That can only take place from the element beryllium (Be). See **document F1e**).
- In this **document F1d** it is outlined how at first hydrogen is formed from protons and electrons from there only the isotopes of the periodic system can be constructed through nuclear fusion.
- During the universe cycle the construction of the isotopes of the periodic system is followed.
- Atomic nuclei do not contain neutrons. The (anti) neutron is composed of one (anti) proton and one (anti) electron. In nuclei each electron of such neutron will always stand firmly attached to at least two protons and never to only one proton as in the free neutron. The neutron is not an independent module, or if such particles are formed in the nucleus; or to the outside of the atomic nucleus!
- The nucleus is much simpler structured with only protons and electrons. The 'strong nuclear force' shows to be a strong electrical force and the 'weak nuclear force' is only the weak magnetic spin effect. The concepts of strong nuclear forces and weak ones dilapidate; they are obsolete.
- The effect of accelerations of the atom in the universe will be processed inclusively what effects those accelerations have in the universe for the orbits of the 'shell-electrons' of the atom and the physical forces and chemical ones thereby be generated.
- **Document F1e** describes the transition from regular isotopes to black hole ones or atoms present in all compact celestial bodies. Black-hole atoms are arranged in accordance with the periodic table of black-hole isotopes that starts with the black hole element beryllium (Be).

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*) With special thanks to the remarks of Franklin Roos;

**) Thanks to Adarshi Yadava for the figures

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* 1. INTRODUCTION:

-) **Approximately 99.99% or more of all higgs are continuously in the relative steady state:**

In document **F1a 2014**, the two elementary proton higgs and two electron ones inferred that apply to all higgs in the state of relative rest and therefore 99.99% or more of all higgs in the universe.

Those four higgs composing the Standard Higgs model Uiterwijk Winkel. These particles are two by two super-symmetrically and both in spatial and physical respect each other 100% anti particle. These elementary particles and antiparticles cannot annihilate! See **Figure 1c** and **figures 6a** and **6b document F1a 2014**.

-) **Approximately 0.01% or less of all the higgs are in an energetically exceptional state:**

Usually for a short time the remaining approximately 0.01% or less of all higgs are energetically in an exceptional state with more or sometimes less rotational energy at higgs level than is the case with the above-mentioned four higgs in the constant state of relative rest. Higgs with too much or too little kinetic energy are released:

- a) during collisions in particle accelerators,
- b) during nuclear (fusion) reactions and
- c) high-energy processes in the universe.

These particles are shown in the current Standard Model of science that consists of approximately 20 parts and is characterized by three generations or energy levels: 1) up/down, 2) charm/strange and 3) top/bottom. These particles are not super symmetrical in contrast to the four higgs of the standard model by Uiterwijk Winkel!

Document F1b discusses the steady state of the group majoranas. These particles are made up of an equivalent number of ordinary higgs particles and anti higgs particles which cannot annihilate. On the outside majoranas do not show measurable a) volume, b) mass, c) charge and d) spin while space, mass, charge, spin and kinetic energy inside the particles are still present completely unchanged. See the **figures 7 – 12 document F1b**.

For measurements such majoranas are very confusing because in that particle mass, charge, spin and kinetic energy are present but from the outside these quantities cannot be measured! Among others the (anti) frankinos, (anti) double frankinos and all forms of (anti) photons belong to the group of majoranas. They will be explained and discussed later.

-) **From these Uiterwijk Winkel's four elementary higgs can be built only the (anti) proton and the (anti) electron:**

Document F1c shows that from these four elementary higgs only the stable proton, stable electron and their anti particles can be built. These particles are the only building blocks of all common atoms/isotopes, of the anti-atom and of the black-hole atoms.

The author replaces all neutrons in atomic nuclei by one proton and one electron. Then all nuclei only contain protons and 'nuclear-electrons'; see **Chapter 2, section 11**. The 'shell electrons' remain the same.

-) **All matter / atoms / black-hole-atoms are made of protons and electrons:**

This **document F1d** indicates that all matter in the universe almost 100% has been based on structures with only ordinary protons and electrons. During the universe cycle (**documents G7** and **G8**) initially only the hydrogen atoms are built.

All other isotopes of the periodic table are only secondarily formed from hydrogen by nuclear fusion in stars and in supernova explosions in which only protons and electrons are involved. Therefore the formed isotopes have been composed entirely of protons and electrons. This buildup of new atoms and their isotopes is carried out by single steps, and by adding successively:

-) one electron to a proton in the nucleus; that electron is a nuclear-electron,
-) one proton to the latter and nuclear-electron attached to the nucleus,
-) placement of a single electron in the electron-shells; then that electron is a 'shell-electron'.

In this way neutrons cannot be formed in any nucleus!

From hydrogen by nuclear fusion for energetic reasons all atoms have been constructed mandatory and universe wide according to the *minimum/maximum 1 principle or exactly one principle* by adding one proton or one electron step by step to the new atom.

The mandatory stepwise build-up of atoms, prescribed by the author, results to all the isotopes, known on Earth and; placed in periodic table of the chemical elements and the table of isotopes (as in Wikipedia) based on the atomic model of Bohr. So in this model the author replaces each neutron in the nucleus by one proton and one electron; **Chapter 2, section 11**. See **appendix 1**.

The author acknowledges the presence of electron-shells and orbitals around the nucleus, as in the atom the shell-electrons should be able to move around their nucleus with their own speeds of approximately two thousand km/s.

That can be only if these electrons orbit the nucleus structured in relatively narrow strips or bands; each band with its own direction. The author does not 'see' electron-clouds. That kind of images occurs when taking pictures or when wave equations are interpreted wrong.

During fusion the nascent atomic nucleus aims and strives to have shell-electrons in the (sub) electron-shells as low as possible energy levels. For that reason the outer shell-electrons try to form together electron pairs as much as possible and organize them in shells with one or four electron pairs.

In addition heat is released and so the lowest possible energy level is reached. See the left side of **Figures 18a - 18n, 19 and 20**.

During fusion the total charge of the under construction atom and its electron-shells with orbitals in these steps always switch with $-\epsilon$ or $+\epsilon$, while ϵ indicates the proton charge.

Chapter 6 of this document describes how, where and what the electron-shell of atoms generate physical and chemical forces. This chapter is a compilation of the older **documents C1, C2 and C3**.

-) **Black hole isotopes and black holes:**

Document F1e describes the transition from regular isotopes to black-hole ones and describes that state for their physical properties and forces. See the right side of **Figures 18a - 18n** to silicium in which the transition from a number of common atoms to black-hole ones is outlined. There it is clear that black-hole atoms have the same basic shape as the ordinary ones.

* 2) PROBLEM:

1) Atomic nuclei do not contain neutrons:

To the present (2015) science assumes that nuclei must contain neutrons because these particles act as 'glue' in a nucleus and emitted during stabilization of nuclei. Neutrons are composed of one proton and one electron. On the outside they do not show direct measurable charge however their spin \downarrow or \uparrow is obvious. In its free state a neutron is unstable and falls apart in one proton and one electron in a quarter of an hour.

In atomic nuclei the *electron* of such 'nuclear neutron' always sit default bound to at least two protons and never to only one proton as in the free neutron. Because of this second bond in the nucleus no longer it is possible to see a separate neutron and to tell apart separate building blocks!

For that reason, the author's mind replaces all neutrons in the nucleus by one independently present proton and one independently present electron standard! So the model of the atom is overhauled and simplified.

2) Neutrons seem to come from specific nuclei:

Neutrons can come from the nuclei. How is this possible when they were not in the nuclei?

Unstable nuclei can stabilize by first to repel one proton and in the next step immediately after to repel one nuclear-electron. Outside the nucleus the two particles can combine to build one neutron that seems to have been emitted from the nucleus with nearly the speed of light which is perceived as one particle. So, very deceptive, it seems as if the nucleus contains neutrons. This is not the case! The resulting neutrons are unstable.

3) No 'strong' nuclear forces and 'weak' ones:

To make it possible the uncharged neutrons to be building blocks in the nucleus scientists introduced *strong nuclear force* and *weak one* to make the nucleus sufficiently stable. Outside the nuclei these forces do not exist. In nuclei separate protons and separate nuclear-electrons attract each other with electrical charge force (= 'strong nuclear force') and with magnetic spin force (= 'weak nuclear force').

The structure of the atomic nucleus and the system of elementary forces and bonds inside is much simpler in design. The current concepts of 'strong nuclear force and weak one' expire completely and are concretely filled with a strong basic electrical charge force and a weak elementary magnetic spin force. These forces also act at nuclear, atomic and molecular level!

4) Reduction of the basic system from four fundamental forces to a system with only two basic forces:

The terms "strong nuclear force" and "weak nuclear force" are now obsolete. Both concepts are to be abolished and replaced by a) the elementary charge force and b) the elementary magnetic spin force!

Gravity is only generated from the 'shell-electrons' in atoms and only in combination with acceleration of the atom in the universe relative to the center C or zero level of the universe; see **documents E3 and E3-1**. Gravity is not an elemental force!

In fact the author splits the electromagnetic force into two separate components:

- a) the elementary charge force or electric force and
- b) the elementary magnetic spin force.

The same forces as mentioned above. Both elemental forces already occur with (anti) mass at higgs level! See **document F1a 2014**.

5) Some explanations:

Now a plausible explanation is lacking:

- a) how universe widely during fusion reactions from hydrogen will be formed all existing isotopes compelling constructed in accordance with the periodic table. See the **table of the isotopes** at Wikipedia.
- b) why universe wide fusion from hydrogen cannot result in a fundamentally different build-up of atoms and isotopes which is known on earth.
- c) how and why universe wide physical and chemical forces are generated on these atoms,
- d) how exactly the structure of the physical bonds and chemical ones between atoms and / or molecules is established.
- e) The structure of physical forces and chemical including their bonds appear to have come from the shell-electrons of atoms or molecules. The shell-electrons generate these forces as a result of the 9 to 11 velocities/accelerations of atoms or molecules with respect to the center C of the universe spherical shell.
- f) how atoms can arrive into a black hole condition in which the electron-shells collapse until right near the atom nucleus and what physical characteristics such black-hole atoms have left then.
- g) In **document F1e** and **Figures 18a - 18n** that collapse of ordinary atoms \geq Be to black-hole atoms is made insightful and the physical properties of black-hole atoms are derived inclusive the physical properties of black holes.

In science a lot of speculation about the physical properties of black-hole atoms and black holes walk round. Concretely and theoretically very little is known. As a result now black holes are surrounded wrongly with a haze of all scientifically accepted myths.

*** 3) QUESTION:**

- 1) Why on our planet the electron-shells of the atoms of the periodic table are ordered standard in groups of two shell-electrons or one 'electron pair' and in (sub) layers filled with more and up to 8 shell-electrons or four electron pairs?
- 2) Why do repulsive electrons combine to pairs?
- 3) In the electron pair two electrons are located as far as possible away from each other. In effect these electrons form a chemical bond because during the formation of such electron pair binding heat was released!
- 4) During fusion reactions the characteristic structure of the electron-shells and the nucleus can be explained considering step by step and energy?
- 5) Elsewhere in the universe a fundamentally different structure of nuclei and (sub) electron-shells than those found on earth is possible? (See the **isotope table of Wikipedia**).
- 6) The periodic table, present on earth with associated system of physical and chemical forces, are they true *compelling* universe wide?
- 7) Does the nucleus contain neutrons or only protons and electrons?
- 8) What are the effects due to velocities/acceleration of the atoms in the universe relative to the center C of the universe? What are the consequences for the atoms of 9 to 11 accelerations experienced by the earth in the universe compared to the center C? C = zero level universe.
- 9) What causes forces on the atom?
- 10) Has the force different components?
- 11) Are physical constants really constant?
- 12) Which physical constants are really constant?

*** 4) ASSUMPTIONS:**

1) The universe possesses the same number of protons and electrons:

In **document F1c** has been derived the construction of the proton and the electron and their antiparticles from the four higgs in **document F1a 2014**.

Ordinary protons and electrons are the stable building blocks of all of the ordinary atoms and their isotopes, and therefore the stable building blocks of all black-hole atoms and their isotopes.

The anti-proton and anti-electron are the only building blocks of the anti-atom. In the anti matter case normally spoken fusion is not possible so that only the anti hydrogen atom and anti hydrogen molecule is possible. Perhaps a stable anti helium-4 atom can be made.

Table 4-1:

Physical characteristics of protons and electrons and their anti particles:

particle	mass	charge	spin
proton	$+m_p$	$+\epsilon$	\$
electron	$+m_e$	$-\epsilon$	\$
anti proton	$-m_p$	$-\epsilon$	\$
anti electron	$-m_e$	$+\epsilon$	\$

Only electric forces and magnetic ones act on the four particles.

Explanations:

- 1) The proton and electron have a volume and an amount of kinetic energy. These building blocks of the atom have only two basic parameters: a) electric charge and b) magnetic spin. Those elemental quantities arise already at the elementary higgs level; see **document F1a 2014 and F1c**. The electric charge force is quantitatively about a thousand times stronger than the magnetic spin force.
- 2) Protons and electrons themselves possess neither gravity nor any other physical or chemical force.
- 3) Gravity forces and other ones occur only if the proton and the electron travel together in an atom having any acceleration in the universe relative to the center C; **document E3 and E3-1**.
- 4) Gravity and these other physical forces and chemical ones are generated solely by the shell electrons in combination with the mentioned velocity/accelerations in universe.
- 5) Both particles annihilate with their anti particles in accordance with the formula $E = mc^2$. When annihilation, however, no mass is converted into energy but only an amount of rotational energy is released in the form of photons in accordance with the formula $E = mc^2$.
- 6) Photons are majoranas. Their net mass, charge and spin are zero for each. During annihilation all mass, charge and spin stay completely unchanged. The same for volume. For majoranas see **document F1b**
- 7) So during annihilation the mass, being normal elementary mass and anti-mass, does absolutely not at all change into energy; only photons (majorana particles) are emitted. By forming these majoranas it seems apparently and quite deceptively as if all the mass or matter/anti-matter is completely transformed into nothing but energy in the form of photons.
- 8) When measured mass with anti-mass, + and - charge and parallel spin with anti parallel one cancel each other into zero. Only dipole forces and quadrupole ones remain outside those particles.
- 9) In view of the spatial structure, see **figures 15a and 15b** of **document F1c**, each proton and electron contains much more mass, charge, spin and kinetic energy than can be measured outside these particles. Therefore on earth and in the universe is much more mass, charge and spin present than we can measure directly! This explains partly the 'dark mass or matter'! See **document E3-1**.

2) All matter and atoms in the universe are entirely composed of ordinary protons and electrons:

All matter in the universe is composed almost exclusively and almost 100% on constructions with ordinary protons and ordinary electrons. The anti-proton and anti-electron are rare, but can be made from ordinary protons and electrons by changing their rotations. The proton and electron result in the formation of

- a) ordinary atoms in accordance with the elements of the periodic table, and
- b) in the state of atoms in black holes.

3) Creation of black-hole atoms:

Black-hole atoms are ordinary atoms whose electron-shells with orbitals have collapsed to just near the nucleus. Black-hole atoms are, like ordinary atoms, entirely composed of protons and electrons, and have the same electron-shells with their orbitals, and even the same number of shell-electrons therein with only single shell-electrons so no electron pairs; see **document F1e** and **Figures 18, 19 and 20**.

Black-hole atoms are standard super cold (about 2.7 kelvin) due to

- a) their nuclei hardly have any more space to vibrate and
- b) the nuclei of black-hole atoms cannot absorb photons and thus kinetic energy any more.

4) Anti-protons and anti-electrons:

By nature in the universe anti matter is not found in the form of anti-protons, anti electrons, or as anti atoms. Such anti matter would instantly annihilate with the omnipresent ordinary protons and electrons of ordinary atoms.

5) The universe is a closed system for mass, matter and energy:

In the **documents G7 and G8** the author derived that the universe spherical shell forms a completely closed system, from which any form of mass or matter and kinetic energy can escape. Only the completely gravity radiation, 100% free of mass and of energy, disappears continuously in the emptiness of the space outside the universe spherical shell.

6) The universe is based on an equivalent number of protons and electrons:

In the previous universe gravity brought together all the matter in the Little Bang black hole exactly to the center C of the universe; **document G6**. During the formation of that Little Bang black hole the universe lost more and more of its speed and with its speed its total contraction gravity. For gravity see **document E3** and **E3-1**. These figures also show a shortened impression of the universe cycle, 'dark matter' and 'dark energy' (= gravitational energy to the center C of the universe).

The current universe started falling below the *critical black hole gravity* of that Little Bang black hole containing all the mass, matter and energy of the previous universe. The disappearance of gravity and the mutual electrical repulsion of the electron-shells of the existing black-hole atoms then ensured that:

- a. Little Bang black hole was exactly the same moment everywhere unstable and fell apart in single black-hole atoms,
- b. without the protection of gravity black-hole atoms themselves are unstable and immediately disintegrate further into an equal number of separate protons and electrons,
- c. They organize in the form of mono-layers of one proton thick and alternated with mono-layers one electron thick.
- d. After that the new universe expands again as almost endless mono-layers of protons and electron ones and with approximately a third to half the speed of light.

During the Little Bang from the previous universe to the new one all protons and electrons remain unchanged for 100%! See **document G6**.

7) The universe passes a completely energy neutral cycle:

After the start of the universe only mono-layers of protons and electrons are present. Atoms and thus gravity are not available; **document G6**.

In this gravity free period the universe spherical shell reached a sphere symmetrical expansion of approximately 3.0 to 3.5 billion light-years from its center C. This expansion of the universe spherical shell is energetically achieved in a completely cost-free manner!

Gravity is 100 % absent for about the first 5 to 10 billion years after the Little Bang until protons and electrons from the mono-layers unite into the (normal) hydrogen atoms for 100%.

8) With the hydrogen atom and molecule gravity enters the universe:

With the forming of hydrogen atom the covalent radical force and the gravity force come to existence.

At the time of formation of the hydrogen atom and directly after that the hydrogen molecule the shell-electrons generate gravity directly and thus create from scratch an enormous amount of gravity energy in relation to C.

That completely free gravity energy versus the center C/zero level of the universe is added entirely to the energy balance of the universe cycle! It is good to remember that the vast amount of gravity energy compared to C, is wholly obtained free of charge; surprisingly a side-effect of the generation of gravity!

This gravity energy is equal to the 'dark energy' of the universe. This 'added' gravity energy is used entirely for universe cycle to allow the settlement of this cycle in a fully controlled manner possible.

9) Universe Cycle consists of 29 steps and can be modeled:

In **documents G7 and G8** author has derived the 29 steps of the universe cycle having an estimated period of about 2 to 3 billion years! All transitions between these 29 steps have been based on the *min/max 1 principle* derived by the author. See **document F1f** www.uitewijkwinkel.eu.

From the current step 23 of the cycle all 22 previous steps of the universe cycle can be smelled out by the *exactly one principle*. Many of these earlier steps themselves are not to make perceptible any more by looking through telescopes or by satellite observations. Also the six coming steps can be prognosticated by the *min/max 1 principle*. With this principle the entire universe cycle can be deduced. Everything happened according to the five classical laws of conservation (mass, charge, energy, momentum and angular momentum). So the next universe can start with a clean slate!

10) The Universe Cycle can be modeled mathematically and then it can be filled quantitatively:

The *min/max 1 principle* ensures that the universe cycle can be modeled mathematically. Then with such a mathematical model the universe and its cycle can be filled in fully quantitatively for the 12 (main) parameters of the universe. See **document G3**. As expected within a few years a full quantitative interpretation of the universe cycle will be available.

***5) OUTLINE OF THE UNIVERSE CYCLE;**

THE ORIGIN OF ATOMS AND THEIR PHYSICAL AND CHEMICAL FORCES:

In this **Chapter 5** briefly the universe cycle is followed to build atoms and their scheme of its physical and chemical forces. The expanded version of the universe cycle is detailed in **document G7** (text) and **G8** (figures). In **chapter 6** of this document the system of physical and chemical forces of those atoms is elaborated briefly and separately. The full **documents** are under **C1 - C4, E3** (gravitation) and **document E3-1**. In **Figures 4a, 4b, 5 and 6** of **document E3-1** the main steps of the universe cycle are shown in brief, and these steps are explained in more detail.

5.1 THE UNIVERSE CYCLE IN A NUTSHELL:

Author's Little Bang was the end of the previous universe, immediately followed by the start of the current universe that took place approximately 40 to 45 billion years ago at a temperature of 0 kelvin! This super cold Little Bang is described in **document G6**. The Little Bang occurred as a result of the finally complete disappearance of all the gravity in a super big Little Bang black hole in which gravity gathered all matter and energy from the end of the previous universe.

That collection and merge of all matter and energy at the center C and zero level of the universe at the expense of by speed generated gravity. At the end of the contraction the universe spherical shell resulted in a massive black hole with a radius of between 50 and 100 million km with less motion in the universe and therefore less gravity. By the decrease of gravity that giant Little Bang black hole grew unstable because the shell-electrons of black-hole atoms repel each other. All the previous time gravity ensured the black-hole atoms were trapped in the central black holes and the Little Bang black hole!

Only in the last stage of formation and completion of the Little Bang black hole the shrink speed relative to C reduces strongly. Due to that at one point the last remnant of the shrink gravity is no longer capable to hold together the each other repelling black-hole atoms in the Little Bang black hole. The phase of the critical black hole gravity is reached whereby the mutual repulsion of the existing black-hole atoms wins gravity that these black-hole-atoms kept locked in the black hole hitherto.

Going below the critical black hole gravity (Cribgra) everywhere and exactly simultaneously the Little Bang black hole is unstable and disintegrates into separate black-hole atoms. Without the protection of gravity also separate black-hole atoms are unstable and immediately afterwards they fall apart into separate protons and an equal amount of free electrons. See **document G6**.

Even during the Little Bang the protons and electrons organize themselves in alternating mono-layers of one proton and one electron thick. Those liberated protons and electrons only possess an elementary charge force

(+ Lek) and an elementary magnetic spin force (+ Mek). These building blocks of the atom themselves do not generate gravity and any other physical force or chemical one; those forces arise only when protons and electrons make an atom. See **Chapter 6**.

-) Electrical spring tension between layers of protons and electrons:

During the decay of the Little Bang a huge electric spring tension occurs between the shell-electrons. The corresponding electrical energy is converted into kinetic energy. As a result these purely spherical mono-layers of protons and electrons move away from C.

With all the disintegrated black-hole atoms all gravity and gravity energy is completely disappeared! So after the Little Bang the expansion starts without any gravity or gravity energy. Thanks to the spring tension and the absence of gravity the expansion of the new universe starts with a completely unobstructed universal constant and uniform speed between a third and a half of the velocity of light from the center C/zero level of the universe. Within their own mono-layers all electrons move with a speed of approximately $2/3c$ around C.

Six to ten billion years after the Little Bang the electrons transferred these transverse velocity largely delivered to the protons and the transverse velocity of the electrons decreased from approximately 200 thousand km/s to about 2 thousand km/s relative to the protons; the speed of the shell elektron in the hydrogen atom. During this period, the mutual distance between mentioned mono-layers protons and electrons increased to the radius of the hydrogen atom.

Exactly at the same time each proton captures one electron. Then exclusively the hydrogen atoms are born and nothing else! (Other elements occur billions of years later during the hydrogen supernovas and resultant fusion reactions.)

5.2 RETURN OF THE HYDROGEN ATOM, GRAVITY AND COVALENT RADICAL FORCE:

With the hydrogen atom combined with acceleration relative to C both gravity (+ G1f) as the chemical covalent radical force (+ R1cf) return into the universe. Throughout the universe spherical shell that gravity is evenly distributed and everywhere within the universe spherical shell the gravity is aiming at exactly the center C of the universe. See the documents under C.

Automatically with gravity the phenomenon of gravity energy (= dark energy) returns in the universe. This infringes the law of conservation of energy! However it is only a matter of choice of zero level.

5.2.1 WITH THE MOLECULAR HYDROGEN THE VAN DER WAALS FORCE AND PHYSICAL PHASES RETURN IN THE UNIVERSE:

The covalent radical force (+ R1cf) results simultaneously in the formation of a pair of electrons in a covalent radical bond (+ R1b) and in the formation of the hydrogen molecule. In addition, binding heat is emitted which heats the newly formed hydrogen plasma to very hot and subsequently it cools down to 100% pure hydrogen gas. With the formation of the hydrogen molecule and the electron pair emerges alongside gravity (+ G2f) and the van der Waals/London force (+ W2f) and will thus further expanding rather than the number of physical and chemical forces in the universe. All electron pairs generate this van der Waals/London force!

If van der Waals/London bond is absent the electron-shells of molecules repel each other. This results in a, whether or not explosive, gas pressure!

The gravity that simultaneously came with the hydrogen results to slow down the speed of the expansion of the universe spherical shell immediately. The energy released is converted into rotational energy of large rotations in the hydrogen gas around approximately 4 to 20 billion 'first rotation points R1' to universe spherical shell.

The plane of rotation which is always locally perpendicular to the expansion speed of the always exactly round universe spherical shell! Around each of these R1's later is formed in the expanding universe spherical shell one of the currently available 4 to 20 billion galaxies!

5.2.2 FORMATION OF SUPER LARGE SPHERES OF PURE HYDROGEN AND 2 TO 4 SMALLER SECOND ORDER SPHERES:

During the next period of 5 to 10 billion years this hot gas cools until its condensation point (20.3 kelvin) with flexible van der Waals/London bonds (+ W2b) and liquid hydrogen is formed. At the location of the condensation points, the gas pressure in the pure hydrogen disappears largely. Due to the local pressure loss on the condensation points a volume of liquid hydrogen accumulates mainly at these billions of rotation points R1

under the effect of gravity. This hydrogen comes from an area with a radius of the universe spherical shell ultimately about 1 to 2 million light-years around those R1's.

In a period of billions of years it results in the formation of 4 to 20 billion or even more growing and becoming hotter and faster and faster rotating super large spheres of pure liquid in the beginning, and later hydrogen plasma. See **figure 4a document E3-1**.

Because of the enormous angular velocity the major central hydrogen sphere flattens and from there 2 to 4 uniform, smaller and slightly cooler second order spheres (Roemer) shape. They also consist of pure hydrogen. See **figures in document G8** about the universe cycle. From it later 2 to 4 spiral arms of the galaxy will be formed.

Finally the total amount of hydrogen concentrated on one R1 is equivalent to the quantity of matter in one galaxy. During that grow of these large central pure hydrogen spheres and 2 to 4 second order ones slightly cooler and smaller, the temperature in the core continue to rise until tens of millions of kelvin eventually.

5.2.3 FUSION IN THE CENTRAL HYDROGEN SPHERE; NOT IN 2 TO 4 SMALLER SPHERES:

That process continues with increasing pressure and temperature until the moment in all central pure hydrogen spheres spontaneously start the fusion process within a few hours universe wide almost simultaneously. In the 2 to 4 formed smaller and less hot second order spheres of pure hydrogen nuclear fusion does not occur then.

The start of fusion in any of those central spheres of gas is equivalent to one Big Bang. During those billions of Big Bangs only hydrogen is available. Other elements are still missing.

In the pure hydrogen spheres fusion starts at a much higher temperature and pressure than the fusion in much later to form stars. In the core of such billions later much smaller stars-to-be-formed always highly radioactive material is present. See **figures of document G8**.

Each of these 4 to 20 billion central hydrogen spheres leads inevitably to such a local Big Bang.

See **Figure 4a document E3-1**. Each hydrogen supernova, Big Bang therefore, marks the start of one galaxy. In that explosion caused by the central black hole of the galaxy and later produced by nuclear fusion, the remaining elements of the periodic system with associated systems of physical and chemical forces.

-1) Loss of gravity and connection gravity energy:

During those Big Bangs of the central spheres a quantity of shell-electrons are bound to the nuclei. These nuclear-electrons lose their ability to generate gravity. In the central hydrogen sphere this nuclear fusion of shell-electrons associated with a loss of approximately 15% of the gravity as that was present just before the Big Bang. See **Figure 6 E3-1**. Due to the loss of 15% this gravity 2 to 4 second order spheres without fusion fly away from their exploding central sphere. The 2 to 4 additional spheres of pure hydrogen plasma are beaten apart by the power of the Big Bangs. Then each of them forms a spiral arm of the later galaxy.

Actually the Big Bang is a short period of only a few minutes to hours containing 4 to 20 billion smaller individual Big Bangs in the universe spherical shell which had a radius of 'only' 2.5 to 3.0 billion light-years then.

Next to approximately 15% correspondingly gravity in billions of Big bangs therefore approximately 15% of the appurtenant gravity energy of the universe spherical shell disappears! See **Figure 6 E3-1**.

-2) The universe is much older:

Those billions of Big Bangs took place about 20 billion years after the Little Bang and about 20 to 25 billion years ago. Our current universe is approximately 40 to 45 billion years old and is about 30 billion older than assumed until now. That prior period of approximately 30 billion years can hardly be observed. See **Figures 4a, 4b and 5 of document E3-1**.

5.3 THE UNIVERSE CYCLE ELABORATED AND THE EMERGENCE OF PHYSICAL FORCES AND CHEMICAL ONES WITH A DIRECTING ROLE FOR GRAVITY:

This chapter follows the universe cycle in brief focusing on:

- 1) the generation of hydrogen,
- 2), from there via nuclear fusion the formation of the other elements of the periodic table,
- 3) the origin of the various physical and chemical forces, and bonds of these atoms.

In short, the development of atoms and of forces followed during the universe cycle.

In document **G7 (text)** and **G8 (figures)** the author deduced much more extensive than here that the universe goes through a completely energy-neutral cycle of 29 steps with an estimated cycle time of 2 to 3×10^{12} years. Therefore the universe can repeat itself endlessly through the exactly predefined pattern of the 29 steps in the universe cycle.

1) Universe Cycle can be modeled mathematically:

This cycle of 29 steps is based on 12 parameters (**document G3**) and soon it can be modeled mathematically with an increasing number of details. The author endeavors to have the first draft of such a mathematical model of the universe available with the help of CERN, the NWO, KNAW and Princeton from mid-2015. Roughly for each of these 29 steps the quantitative limits of the 12 parameters of the universe can be fill in and thus the conditions for each step separately. From here the current and maximum limits of the universe as a whole can be deduced.

Here's a brief overview of this cycle with a few repetitions unfortunately.

2) Short representations of the universe cycle; the creation of forces on atoms:

During the Little Bang the Little Bang black hole containing all available protons and electrons together falls apart due to ultimately, the complete loss of speed and thus all of gravity in that Little Bang black hole. The Little Bang black hole that became unstable falls apart in single black-hole atoms because the electron-shells of the black-hole atoms repel each other net. Without the necessary protection of the required minimum amount of gravity those black-hole atoms themselves completely unstable.

When the gravity drops below *Critical black hole gravity (Cribgra)* all black-hole atoms disintegrate into an equivalent number of protons and electrons as the higgs of which they have been constructed, have only two elementary basic forces: a) electric charge force (+ Lef) and b) magnetic spin force (+ Mef).

After the Little Bang the freed single protons and electrons organize themselves in mono-layers. They expand evenly, sphere symmetrically away from C without gravity with a speed between 100 and 150 thousand km/s.

See **document G6**.

After the Little Bang the liberated protons and electrons can synthesize only the hydrogen atom. That step in the universe cycle took place approximately 5 to 10 billion years after the Little Bang and an expansion of around 2.5 to 3.0 billion light-years.

3) With the hydrogen atom new physical forces and chemical ones have been created:

With the formation of hydrogen atoms, followed by the formation of hydrogen molecules, a first major expansion of the number of physical forces and chemical ones happens with among others

- a) gravity force (+ G1f) and (+ G2f)
- b) the chemical covalent radical force (+ R1f) and
- c) the van der Waals force/London force (+ W2f) and
- d) the force due to gas pressure.

(The addition (1) stands for force of the single shell-electron, and (2) represents that of the electron pair.

The (f) stands for power and (b) for binding)

The gravity generated by hydrogen is precisely aimed at the center C of the universe everywhere within the exact round universe spherical shell and. This slows down the expansion rate of the universe compared to C. The energy released is fully converted into rotational energy that results in angular velocity. The rotation components are in the direction of the expansion velocity locally and anywhere. **Figure 1 E3-1**. This results in the formation of large rotation areas around 4 to 20 billion or more first centers of rotation R1. That rotation centers R1 form the germ of the later galaxies. For drawings see **document G8**.

4) Condensation of hydrogen gas; formation of pure hydrogen spheres culminating in Big Bangs:

In the course of time, the hydrogen gas cools off to its condensation point in which hydrogen gas liquefies and flexible van der Waals bonds (+ W2b) are formed. The disappearance of the gas pressure occurs due to gravity in a period of billions of years 4 to 20 billion super large rotating spheres of pure hydrogen R1 with around 2 to 4 rotating sub spheres of hydrogen. Such a system of one central hydrogen sphere and 2 to 4 accompanying sub spheres (Roemer) rotate faster and faster and especially the large central sphere getting hotter and hotter until millions of kelvin until finally fusion starts in every central hydrogen sphere. In those 2 to 4 sub spheres of pure hydrogen fusion does not occur.

This is step 16 in the universe cycle which consisted of from 4 to 20 billion or more Big Bangs; for each central hydrogen sphere R1 and one for later galaxies! Those billion Big Bangs took place almost simultaneously in the same universe clock time.

5) Formation of higher elements during fusion

During this nuclear fusion reactions from hydrogen exclusively all other stable and unstable isotopes of the periodic system are formed in accordance with the table of isotopes. The author replaces each neutron by one proton and one nuclear-electron. During the formation of the isotopes known to us also arise all the other physical and chemical forces. See **Chapter 6.1** of this **document F1d**.

During those hydrogen supernovas the central black holes are created. They are present in the center of all galaxies. By the loss of at least about 15% of the originally present gravity these 2 to 4 *not fusing* secondary spheres of pure hydrogen are thrown by the explosion from the central black hole. Each of these secondary spheres beaten apart transforms through angular velocities into a spiral arm of the galaxy.

6) All galaxies disappear into their central black hole and end expansion universe:

Now we are in step 23 of the universe cycle of 29 steps and we arrived approximately 40 to 45 billion years after the last Little Bang and hence we are relatively early in the expansion of the universe spherical shell. In this preceding period of approximately 40 to 45 billion years has been realized, both the main part of the number of steps and the greater part of the maximum expansion of the universe. See **Figures 4a, 4b** and **5, E3-1**.

After about 150 to 250 billion years in all 4 to 20 billion galaxies in the universe all hydrogen, helium and lithium will be converted into elements \geq beryllium (Be) through nuclear fusion in stars and through nuclear fusion in local small supernovae. Only from beryllium the atoms possess two or more pairs of electrons and *inside* the atoms ordinary van der Waals/London bonds can be formed between the electron pairs which force to collapse these electron-shells towards the nucleus. Before collapse of the electron-shells of ordinary atoms into a black-hole-atom requires a minimum of two electron pairs! So that collapse does not occur with the isotopes of hydrogen, helium and lithium!

At the higher isotopes than beryllium the electron-shells of an ordinary atom collapse to the same electron-shells however then situated right near the nucleus. Virtually all available space between the electron-shells disappears during that collapse. See **Figures 18, 19** and **20**.

Ordinary atoms whose electron-shells collapse to very near the atomic nucleus transform into black-hole components with the same basic structure of the electron-shells and their orbitals as with ordinary atoms.

Due to the increase of the speed of the shell-electrons to near the speed of light, electron-pairs are no longer possible. During that collapse all electron pairs fall apart into single electrons. So the van der Waals/London force and its binding disappear again! The black-hole atom is many trillions of times smaller than the corresponding volume become ordinary atom!

7) No singularity possible:

Kinetic energy prevents black-hole atoms to collapse further to a state of singularity. Black holes are the maximum possible compression of matter in the universe.

8) During the universe cycle hydrogen, helium and lithium must fuse to beryllium or higher:

The elements H, He and Li only have zero or one pair of electrons. Inside that most light elements cannot be formed van der Waals bonds and therefore cannot be turned into black-hole atoms and therefore they cannot be absorbed into a black hole! Thus around all black holes a layer containing solid hydrogen, lithium and liquid helium accumulates. This applies especially to the central black holes that exist in the center of every galaxy. In many local small black holes in galaxies the temperature and pressure remain too low for nuclear fusion as opposed to the large central black holes in galaxies where fusion to beryllium and higher does take place. After nuclear fusion of the lightest elements of the galaxy they still can be included in the central black hole.

Over the next 150 to 250 billion years all the stars in the galaxies get exhausted through nuclear fusion and local smaller supernovae 'burn out' completely and all remnants of those stars with their planets and local small black holes will be swallowed completely by the black hole. Around all the centers of galaxies such fusion takes place. The central black hole itself always has a temperature of only about 2.7 kelvin! By fusion shell-electrons disappear with their gravity and gravity energy. See **Figure 6 E3-1**.

Gravity inhibits the expansion of the universe spherical shell continually and gradually the expansion velocity is completely converted into angular velocity of the galaxy. All expansion energy ultimately comes fully into these central black holes. The "equatorial" speed of that central black holes increases to approximately 100 to 150 thousand km/s always in the coming billions of years and is fully concentrated in that central black hole. (Meeting the law of conservation of angular momentum.)

9) All higgs constructions as frankinos and photons are transformed back into protons and electrons:

In that period all by stars emitted photons previously and yet to be emitted ones and all cosmic radiation will be formed back into photons (**F1b**), rotor photons, protons and electrons sequentially, and hydrogen atoms (**document F1c**). And all atoms \geq beryllium ones will be transformed completely into black-hole atoms (**F1e**) inclusive the atoms in stars to be born. And through that long path they all will have been absorbed into this central black hole. The current step 23 is only about 5 billion years old and will have some 150 to 250 billion years to continue.

All radiated energy previously by supernovae and stars and cosmic rays ultimately come to an end indirectly into one of the central black holes of 4 to 20 billion or more galaxies.

10) Dark Universe:

At the end of the expansion of the universe spherical shell, in about 150 to 250 billion years all the stars have burned and all remnants of stars, planets and local black holes absorbed into their central black hole. At the end of the current step 23 the universe spherical shell is completely dark. Outside that 4 to 20 billion central black holes in the universe spherical shell is not to be seen any single photon or form of any cosmic particle. In the universe only gravity-radiation is present which has not any form of mass, matter, charge, spin or energy!

The central black hole is the final remnant of one or several smaller galaxies and reached at the end of the expansion a radius of approximately 30 to 50 thousand km with an 'equatorial' speed of 100 to 150 thousand km/s.

Only when all matter and all energy (transformed back into matter) of the galaxy is reabsorbed into its own central black hole or into one of the other central black holes is the expansion of the universe comes to an end as a whole spherical shell. All expansion energy is completely converted into rotational energy of the central black holes.

5.3.1 CENTRAL ROLE OF SHRINK-GRAVITY DURING THE RETURN TO C:

Under the influence of gravity the still exactly round universe spherical shell occupied with 4 to 20 billion large central holes always returning and shrinking exactly to the center C of the universe. See **Figure 4b E3-1**. During the retreat to C gravity continuously ensures the correlation of the positions of these central black holes in the universe spherical shell so that it remains perfectly round.

-1) Gravity is an acceleration-sensitive force:

In document **F1a 2014** the author disconnects gravity and mass deliberately. In documents **C1, C2, C3, E3** and **E3-1**, the author has concluded that gravity (+G1f) and (+ G2k) like the other physical and chemical forces are only generated by:

- a) the shell-electrons of the atom, and
- b) only if that atom has a translational acceleration in the universe relative to the center C or
- c) if that atom has a rotational one in a celestial body.

Like other physical and chemical forces gravity is exclusively the result of (general) acceleration of atoms in the universe relative to the center C. Those forces and gravity show themselves in principle in all ordinary atoms and all black-hole atoms or atoms in a black hole state.

-2) Gravity has been built up of 9-11 acceleration components:

Any form of linear acceleration and angular one generates its own force component. Gravity and other physical forces and chemical ones and their bonds on Earth and elsewhere in the universe are made up of as many components as the earth or any other celestial body to 9 to 11 made accelerated movements within the universe spherical shell relative to the center C of the universe!

-3) Gravity can completely disappear and can be zero:

- The gravity shell generated by the electrons and electron pairs is proportional to the acceleration of the atoms in space relative to the center C.
- The other physical and chemical forces of the shell-electrons are proportional to the square of the accelerations of the atoms in space relative to the center C.

When the ordinary atom does not feel any acceleration compared to C at all then the construction of such an ordinary atom stays in position and all know forces disappear except the electrical and magnetical ones! All ordinary atoms are then both physically and chemically completely inert.

Gravity is not mass related as science thinks the year 2015! See **document E3** and **E3-1** for gravity.

-4) In black holes gravity keeps the black-hole atoms together and thus stable:

In a black hole the negatively charged electron-shells of the collapsed black-hole atoms repel mutually. Thus, in all compact celestial bodies or black holes there is a huge electric 'spring tension' so that all compact celestial bodies and black holes themselves are extremely unstable!

In black holes the repellent black-hole atoms are held together only if such a black hole itself generates more gravity than the existing mutual electrical mutual tension of the black-hole atoms!

For all compact celestial bodies or black holes a minimum amount of gravity is required; the so-called *critical black hole gravitation (Cribgra)*. To remain stable as black hole the overall gravity must always be more than the *critical black hole gravitation*. If not, then the black hole explosively dissociates into single black-hole atoms. These atoms themselves are also unstable and then they explosively decay into single protons and electrons.

-5) Gravity inhibits the universal expansion of the universe spherical shell steadily to zero and after it the contraction of the universe starts accelerated:

After 150 to 250 billion years all the galaxies will have disappeared in their own rapidly rotating black hole. In the meantime also gravity slowed the expansion of the universe being the universe-sphere-shell down to zero. At that moment everywhere at the same time an end to the further expansion of the universe-sphere-shell on all sides equal distance of about 2.5 to 3.5 billion light-years from C!

Then the universe-sphere-shell has a perfectly round spherical shape, uniformly distributed, is occupied by approximately 4 to 20 billion or more central black holes. The expansion energy with time increasingly converted into rotational energy of galaxies and results at the end of the expansion in the maximum 'equatorial' speed of their central black holes of approximately 100 to 150 km/s; see **Figure 2 E3-1**. The thereby generated equal rotation-gravity is directed everywhere to the center C/ zero level of the universe. Part of that expansion energy is converted into gravity energy. In this process the total angular momentum is conserved.

-6) Shrink speed is directed opposite to the angular velocity component of the central black holes:

Then the universe-sphere-shell with 4 to 20 billion central black holes under the influence of gravity shows contraction again towards the center C; see **Figure 4b E3-1**. This shrink speed and associated shrink gravity is physically seen, however, for 100% in the opposite direction to the angular velocity component of the central hole at the end of the expansion! This shrinking of the universe-sphere-shell and return of those 4 to 20 billion central black holes to C is only possible if this comes at the expense of their own angular velocity!

With all central black holes returning to C, that contraction results in a very gradual decrease of the own angular velocity and the associated rotation-gravity. That continuous braking of the acceleration results in a more or less constant shrink speed of approximately from 0.10 to 0.15 Mm/s which is equal to 100 to 150 km/s.

Going to C all central black holes lose more from their angular velocity and thus decreasing their own rotation gravity! Since the mutual distances between the central black holes also become smaller the net shrink speed of the universe spherical shell remains more or less constant while the central black holes rotate slowly decelerated and generate less gravity. See sketchy **figure 6 paper E3-1**. The shrink of the universe-sphere-shell is not an accelerated contraction. At the end of this universe a Big Crunch does not happen!

Overall the shrink of the universe proceeds very slowly and quietly. Therefore the period of contraction requires more than approximately 2 to 3 trillion (10^{12}) years and it takes roughly about 10 times longer than the period of the expansion.

Only at the end of the retreat to C all central black holes are completely stripped of their angular velocity and the corresponding rotation-gravity. In all central black holes that rotation even stops completely. Then only shrink speed and its associated shrink gravity remain.

This shrink gravity takes care of the minimum necessary gravity to keep all central black holes above their *critical gravity* and to keep them stable! During the contraction the total gravity energy and gravity energy of the universe continue to decrease. (That could not be if gravity would be associated to mass as Newton and Einstein assumed!)

-7) All central black holes merge into a single Little Bang black hole around a fixed center C:

In this way at the end of the previous universe all 4 to 20 billion central black holes herd together again and in the meantime stripped for 100% of their angular velocity and corresponding gravity and gravity energy. Under the ultimate direction of the shrink gravity all central black holes come back again to the center C exactly the same way as in the begin of the universe. See **Figure 6 E3-1**. Since these billions central black holes go first together in one big black hole, temporarily as a torus universe, made of black-hole material; see **Figure 4b E3-1**. This torus universe of pure black hole material then shrinks further to the Little Bang black hole with a final radius of about 50 to 100 million km. That process is shown in **paragraph 15 Figure 4b!**

That center C of the universe is always exactly in the center to form the Little Bang black hole. Exactly the same point C, moreover, applied to all previous Little Bang and all future cycles of the universe. In each cycle the center C is always situated on almost exactly the same place. The universe has only one fixed center C.

-8) Universe demands constraints on theoretical considerations:

Due to the structure of the universe spherical shell that cycles again and again theoretical considerations should be made only:

- a) from the center C of the universe as a universal origin of place in the universe,
 - b) from the moment of the Little Bang as the start of this universe and universal absolute zero of time,
- At every Little Bang time and space finished the previous universe and start after the Little Bang time and space of the new universe again. In theoretical considerations, both the place of observation as the zero point of time recorded, and thus *strictly defined!*

During theoretical considerations about the universe it is never allowed:

- a) to choose your own place of observation or*
- b) to choose your own zero point of time.*

Deriving the theory of relativity, Einstein has not adhered to this, then unknown stringent assumptions! In 2015 it shows it has disastrous consequences for the sustainability of the theory of relativity and the basis of current science.

-9) Formation of the universe spherical shell with only 4 to 20 billion central black holes:

Prior to the Little Bang a super cold Little Bang black hole is built consisting of approximately 4 to 20 billion smaller super cold central black holes all with a temperature of about 2.7 kelvin and a radius of approximately 30 to 50 thousand km. Each central black hole is the concentrate of one galaxy containing compressed all matter and energy of that galaxy.

Such a central black hole does not only contain the matter of 100 to 200 billion stars and their accompanying planets but also all radiation, emitted by galaxies previously. Again that radiation is via formation of protons, electrons, atoms, and black-hole atoms entrapped into the own central black hole of the galaxy or into one of the other billions of galaxies.

That building up of the Little Bang black hole takes place around a fixed point in the universe: the Little Bang point also the one of a kind center C of the universe. C is exactly the same starting point of all previous universes and all future universes. Gravity ensures the coordination between those billions central black holes and also makes sure that the entire approximately 4 to 20 billion move to C ones - central black holes:

- a) all come back exactly simultaneously at that center C of the universe and that
- b) their kinetic energy is quite uniformly distributed over all directions.

10) The formation of the Little Bang black hole:

The shrink speed (towards the center C of the universe) that does not rotate any longer as a central black hole is in the end only a few dozen kilometers per second. At some point the not any more rotating central black holes one another merge together into a single first universe-sphere-shell with a hollow interior void space and having a radius of about ten astronomical units and having a thickness of approximately 40 to 50 thousand km. **Point 14 Figure 4b document E3-1.**

That universe-sphere-shell of black-hole atoms continues to shrink with a speed of several tens of km/s. Due to the ever increasing mutual displacement of the black-hole atoms universe-sphere-shell of pure black hole matter then shrinks more and more slowly until finally one big exactly round Little Bang black hole is created with a radius between 50 – 100 million km with C always exactly in the center. That Little Bang black hole always has a temperature of about 2.7 kelvin.

By mutual displacement of black-hole atoms takes shrink speed during the formation of the Little Bang black hole around the Little Bang point C continues to decrease. In the final phase of the confluence of the universe-sphere-shell of black hole matter shrink speed decreases within that form Little Bang black hole compared to C further and further away from first about a few tens of km/s reduces to a few m/s and finally to mm/s and in the reversal point to zero relative to C/zero level!

-11) No singularity:

That contraction will result in a super cold and super soft crunch. The shrink speed diminishes with the shrink gravity and thus the gravity energy also continues to decrease until zero. The formation of a singularity is impossible!

-12) Decrease gravity of the Little Bang black hole to the *critical black hole gravity (Cribgra)*:

In the final stage of formation of the Little Bang black hole total gravity continues to decrease until finally *the critical black hole gravity* of the Little Bang black hole is reached. That happens just before the formation the Little Bang black hole is completed to one big solid sphere with a radius between 50 – 100 million km and the hollow interior space is completely filled. The center C is always exactly in the middle of the Little Bang black hole in the center of the hollow interior!

-13) The Critical Black Hole Gravity (Cribgra):

In the black-hole atoms are shell-electrons as individual electrons in electron-shells which are located in the immediate area around the atomic nuclei. In black-hole atoms the shell-electrons move with practically the speed of light around their nuclei. At these speeds electron pairs are not any longer possible. Those speeding shell-electrons ensure that all black-hole atoms are naturally very unstable.

Atoms in a black hole state remain stable only in a black hole that provides by itself and generated enough gravity to hold the locked and repellent black-hole atoms together within such a black hole.

To remain stable as a black-hole atom black holes must have sufficient acceleration or deceleration otherwise the gravity becomes too low! (This lower limit appoints the author as *Critical black hole gravity or Cribgra*). This phenomenon is equivalent to the smallest possible black hole with a radius of at least supposedly approximately 5 to 10 km which is coupled to an equatorial rotation speed of about 50 thousand km/s and energy level. Such necessary amount of gravity should be generated by the shell-electrons of black-hole atoms in combination with enough acceleration in the black hole. *Critical black hole gravity* is in fact a measure of the minimum required angular velocity or rotational energy of black holes. *Critical black hole gravity* can be determined theoretically.

5.3.2 SUPER COLD LITTLE BANG:

1) Little Bang, no conversion of mass into energy and no conversion of energy into mass:

The Little Bang 'of' Uiterwijk Winkel is not based on $E = mc^2$. There is no conversion of mass into energy or the other way around. During the Little Bang all protons and electrons remain completely unchanged in tact! During the Little Bang only the structures of the black-hole atoms disappear. They disintegrate into an equivalent number of single protons and electrons. Due to the disappearance of the atom disappears temperature which is equivalent to 0 kelvin. The Little Bang occurs at an equivalent of 0 kelvin and is absolutely dark because no light or heat can be released.

2) The Little Bang:

Upon reaching the *critical limit of gravity* the Little Bang black hole decays everywhere and exactly the same time because gravity moves with infinitely high speed. The Little Bang black hole is first set in single black-hole atoms which are unstable from themselves.

All black-hole shell electrons fly away from their atoms all over the exact same time with practically the speed of light. That was the revolving speed around the nuclei of the shell-electrons. These fast electrons split from their neighboring bare nuclei into individual protons and electrons. Now there is a mix of nuclear-electrons, protons and shell-electrons. The high-speed shell-electrons accelerate these ex nuclear-electrons to an average speed of approximately 200 thousand km/s for all available electrons.

At the Little Bang the black-hole atoms decay through four simple between steps into an equal number of single protons and electrons. During the Little Bang the protons and electrons arrange themselves at 0 kelvin into spherical mono-layers alternating one proton and one electron thick, C always being in the center! The previous universe based on exactly the same number of protons and electrons as are present in this universe, and will be present in the following universe.

For small black holes that will become unstable shall show an extremely violent explosion. Only the disintegration of the Little Bang black hole goes very quiet due to the absence of gravity. This 'explosion' happens without any form of photons and heat. The Little Bang is described in **document G6**.

5.3.2.1 NO INFLATIONARY EXPANSION OF THE UNIVERSE:

-1) The (electrical) spring tension does inflate the 'Little Bang black hole with an end speed between 100 and 150 thousand km/s:

For the Little Bang the electron-shells of the densely seated black-hole atoms showed enormous mutual electrical repulsion or 'spring' tension. During Little Bang that spring tension and thereby associated spring energy is freed. As a result, this system of mono-layers of protons and electrons is to remove from C evenly in all directions. The former Little Bang black hole is, as it were shelled off whereby it expands with a constant expansion speed between 100 and 150 thousand km/s or $1/3c - 1/2c$.

2) Inflationary expansion of the universe is not possible:

After the Little Bang the universe is expanding not inflationary anyway! That would be completely inconsistent with the maximum (light) speed which applies to all higgs and all particles with mass. This speed limit applies to all protons and electrons and thus for the entire universe-sphere-shell after the Little Bang!

Only the totally massless gravity radiation and the universe clock time are both not bound by the speed of light. Those variables move with infinite speed in the universal and even move beyond. All gravity and universe clock time leave the universe immediately fully!

All particles with mass always have exactly the same universe clock time during the universe cycle! In principle differences (universe clock) time are not possible within the universe-sphere-shell! That universe clock time is our time!

3) Creation of the hollow interior:

After circa 1,500 years the perfectly round hollow interior is created. Together making the universe-sphere-shell the spherical mono-layers of protons and the electrons are speeding sphere symmetrically with 100 to 150 thousand km/s away from C. After that point the thickness of the spherical shell decreases with time.

After the Little Bang all the kinetic energy of the universe itself went to this system of expanding mono-layers of protons expanding with 100 to 150 thousand km/s and the electrons move in addition to the expansion transversely with 200 thousand km/s revolving C. After the Little Bang gravity is completely absent!

During this period the former Little Bang black hole changed into a giant sphere with a radius between 500 and 750 light-years consisting of mono-layers of protons alternated with electrons ones! See **phase 0 Figure 4a document E3-1**. Only about 1,500 years after the occurrence of these super cold Little Bang the hollow and absolutely empty inside space around the center C of the universe is created. At this time the spherical shape of the universe changes into a sphere shell.

4) Thickness of the universe-sphere-shell diminishes:

With the emergence of the hollow inner space the volume of the universe spherical shell with protons and electrons is conserved. From then on, there is a universe sphere-shell which is getting thinner during further expansion. This increasingly thin spherical shell while still retains the perfect round shape and is still filled with mono-layers of protons and electrons. Atoms are lacking, and thus gravity is.

That situation of unhindered expansion of mono-layers after the Little Bang remains unchanged for about the next 5 to 10 billion years. In that period, the sprawling universe-sphere-shell is getting thinner and takes its thickness from 500 to 750 light-years to a few - tens of km. All the while the universe sphere-shell continues to be perfectly round and exactly the same thickness uniformly and is always composed of mono-layers of protons and electrons.

In the spherical electron orbits C the electrons have in addition to the expansion velocity a second, transverse velocity of approximately 207 thousand km/s. This is still far too high for the formation of hydrogen atoms. As long as gravity is absent, hydrogen is missing!

Those mono-layers of alternating fast protons and electrons attract each net electrical mutually. As a result, mono-layers of protons and electrons remain close to each other without being able to touch each other really physically. Within this structure of mono-layers of protons and electrons in principle these particles cannot exchange mutually kinetic energy!

5) Until the formation of hydrogen the universe expands completely unhindered because gravity is absent:

The expanding layers of single protons and electrons do possess mass and matter but do not generate atoms and thus neither gravity; see **document F1a 2014**. Gravity arises only when the expanding mono-layers of protons and electrons together form the hydrogen atom and that only happens about approximately 5 to 10 billion years after the Little Bang! See **point 2 in Figure 4a document E3-1**.

As long as the atom is absent the universe can expand unimpeded with 100 to 150 thousand km/s by the absence of gravity. With time the universe spherical shell is becoming increasingly thinner and all the while retaining his perfect sphere or balloon shape!

6) Yet excruciatingly slow transfer of energy from the electrons to the protons:

Yet is extremely and painfully slow yet a practically negligible, but not being absolutely zero, transfer takes place of the kinetic energy of electrons to the mono-layers with protons between the mono-layers.

These mono-layers of protons and electrons act during those first 6 to 10 billion years after the Little Bang in fact as virtually endless perfect ‘frictionless bearings’. See **end of Section 1 Figure 4a E3-1**.

5.3.3 FORMATION OF THE HYDROGEN ATOM:

-1) Formation of the hydrogen atom:

Because of this extremely slow energy transfer is possible only after approximately 6 to 10 billion years after the Little Bang the main part of the transverse kinetic energy of the electrons transferred to the protons. The expansion velocity of these mono-layers of protons and of electrons is therefore all sides evenly with increased net about 50 km/s.

The transverse velocity of the electrons relative to the protons in the period decreases by about 200 thousand km/s to about 2 thousand km/s. This speed is equal to the velocity of the shell-electron of the hydrogen atom.

Due to the stretching of the universe-sphere-shell in that period also simultaneously, the mutual distance between the mono-layers of protons and electrons increase to the minimum required distance which is present between the proton and the electron-shell in the hydrogen atom.

At some point all the spatial and physical conditions fit in such a way that exactly at the same time every proton catches its own electron forming of the hydrogen atom! During this extremely short step of a split second not any unbound proton or electron remains. The formation of the hydrogen atom happened 35 to 40 billion years ago. Then the radius of the universe spherical shell reached already an omnidirectional exactly the same radius of 2.5 to 3.0 million light-years. At the time of formation of hydrogen the expansion rate remains virtually unchanged 100 to 150 thousand km/s.

-2) For the hydrogen next to the temperature gravity and covalent radical force exist:

In the formation of the hydrogen atom (bond) heat is not released and UV does not flash. For the first time after the Little Bang during the formation of the hydrogen atom the physical phenomenon of the atom and hence the phenomenon of temperature manifest. At that time, the hydrogen atom finds itself still close to 0 kelvin.

With the hydrogen atom and its acceleration in the universe at the same time:

- a) a major deviation in the orbit of the entrapped shell-electron relative to an ideal orbit and
- b) electron-shell possessed already a large amount of ‘added’ kinetic energy coupled to the acceleration of the atom in the universe with respect to C.

Ad a) That deviation of the desired ideal orbit ‘fights against’ the shell-electron by generating gravity (+ G1f) (focuses precisely on the center C of the universe) that tries to slow down the speed anywhere in the universe-sphere-shell. An effect is the decrease of the deviation of the electron orbit. See **Figures 1a, 1b and 1c document E3-1**.

Ad b) The effects of ‘added’ kinetic energy are covered in **section 5.3.4**.

-3) Free gravity energy added to the universe cycle:

With gravity returning in the universe an enormous amount of gravity energy (C = zero level) is added to the cycle of the universe. This is real energy and no illusion, because the zero point of the universe is located in C. It is not allowed to choose any other zero point in universe. During the complete universe cycle this gravity energy will be fully consumed. See **Figure 6 of E3-1. This gravity energy is in fact ‘dark energy’**

-4) Gravity inhibits the expansion of the universe-sphere-shell:

From the moment of the emergency of gravity it decelerates uniformly the expansion of the universe-sphere-shell compared to C. The slowdown in the expansion rate of the universe compared to C is still ongoing, and that goes especially for the next 150 to 250 billion years when the expansion comes to a complete stop and all galaxies are disappeared in their central black hole.

When you look back into the universe from now (2015) then you look through the relatively thin universe-sphere-shell. Due to deflection of light by it, the universe *seems* to expand faster and faster observed by the redshift. However this is an illusion or a wrong interpretation. See **figure 4a of paper E3-1**. The different perception horizons for a) infrared (about 18 billion light-years), b) light (13.8 billion light-years) and c) cosmic particles (5 to 10 billion light-years) are shown there.

5.3.4 FORMATION OF MOLECULAR HYDROGEN:

1) Formation of hydrogen molecule and its forces:

Ad b) with only the hydrogen atom the shell-electron generates not just gravity (+ G1f) but also the covalent radical force (+ R1cf). Chapter 6 explains how the atom arise physical forces and chemical ones where the forces are generated within the atom and the point where the force is applied.

Two hydrogen atoms will form a chemical covalent bond radical (+ R1cb) thanks to this chemical covalent radical force (+ R1cf). Only the hydrogen molecule can be formed during which chemical bonding heat is released because a part of this 'added' kinetic energy is converted into heat. The formed electron pair thus reached the energetically most favorable orbit rather than the two separate shell-electrons!

That bond heat (**Chapter 6**) ensures that it is just very hot hydrogen gas so that the temperature increases anywhere in universe-sphere-shell from zero to several thousand kelvin. The gas then becomes plasma.

2) Temperature and photons of light in the universe sphere-shell:

Only during the formation of the hydrogen molecule, the until then 5 to 10 billion years totally dark and absolute cold universe shows a modest radiation of photons in the form of light and heat next to gravity and temperature for the first time and widely **Figure 4a explanation point 3 E3-1**. From the earth this happening cannot be visible any more!

3) With the formation of the hydrogen molecule and electron pair, the van der Waals/London force and the physical phases return in the universe:

With the formation of the electron pair in the H₂-molecule, the system of forces is extended with the gravity of electron pair (+G2f) and with the physical van der Waals force (+ W2f). That force is connected to the physical phases of:

- a) gas: separate repelling each other small molecules with at least one pair of electrons and thus with the van der Waals/London force. In gases and plasmas is not any van der Waals/London bond;
- b) liquid: molecules with flexible van der Waals/London bonds and
- c) solid: molecules with fixed der Waals/London bonds.

4) The released binding heat does expand explosively the universe-sphere-shell

With that shaped electron pair in combination with released heat and the chemical bonding and pure van der Waals force (= gas force) that hot hydrogen gas shows an explosive gas force (+ W2gf) in a surrounding area on either side of the universe-sphere-shell that from physical point of view is a pure vacuum. By that gas force the hitherto rather 'solid' and only a few - tens of kilometers thick universe-sphere-shell being of pure hydrogen gas expands explosively on both sides with a few tens of km/s.

5) Gravity decelerates expansion; expansion energy is fully converted into rotational energy:

The magnitude of the gravity generated by hydrogen and expansion velocity is uniform in size everywhere within the universe-sphere-shell and everywhere precisely aimed at the center C of the universe. Gravity within the universe-sphere-shell slows down the expansion rate relative to C. (That process is currently still going on!) The energy released thereby cannot be converted into heat, but can only be converted into rotational energy. The rotation component is always in the direction of the local expansion velocity. In the universe-sphere-shell occur many billions of small rotation regions R1 by inhibiting.

5.3.5 COOL DOWN TO HYDROGEN CONDENSATION POINT; FORMATION OF PURE HYDROGEN SPHERES:

1) Formation of 4 to 20 billion super large liquid hydrogen gas spheres:

Immediately after the formation of the hydrogen atom the fairly thin universe-sphere-shell or the universe is still expanding with high speed of 100 to 150 thousand km/s of. With hydrogen gravity is generated and that gravity decelerates the expansion of the universe-sphere-shell immediately strong. (Gravity is proportional to speed).

The loss of kinetic energy cannot be converted into heat but can only be converted into rotation energy: new rotations occur locally everywhere perpendicular to the expansion velocity. Within the still expanding universe-sphere-shell of pure hydrogen gas thereby eventually approximately 4 to 20 billion large rotating areas R1 emerge and create local angular velocity within the universe-sphere-shell. **Point 3 Figure 4a E3-1.**

Due to the gas pressure the hydrogen universe-sphere-shell being thousands of kelvin in the meantime expands explosively on the inner side and the outer one of the universe shell with tens of km/s. By that expansion and emitting light and heat it cools, by gravity expanding more and more slowly, universe-sphere-shell of hydrogen continues to decrease; adiabatic expansion.

Millions of years later that hydrogen gas with increasing angular velocities achieves the condensation point of hydrogen gas. Then the gaseous hydrogen (+ W2gf) turns into liquid hydrogen (+ W2fb) with flexible van der Waals/London bonds. **Point 4 figure 4a E3-1.**

Then the condensing hydrogen gas loses almost completely its *gas pressure*. Only an extremely low vapor pressure still remains! (This minimal vapor pressure of hydrogen is still present in the intergalactic space)

Due to the condensation of hydrogen within the universe-sphere-shell pressure differences arise in the hydrogen gas disk meanwhile rotating locally everywhere.

This results in tens of billions of spiral currents of a gaseous and by now liquid hydrogen in the direction of these 4 to 20 billion or more first points of rotation R1 that pass into the first condensation points R1 where, under the influence of gravity, ever larger and more and more flattened spheres emergence of pure liquid hydrogen. To be continued **Item 3 to item 5 figure 4a E3-1.**

On this rotation and concentration points R1 by gravity more and more liquid hydrogen accumulates in the form of spheres which are also becoming increasingly hotter with time and also at increasing angular speed, and therefore begin to generate an increasing rotation gravitation.

2) Formation of 2 to 4 smaller secondary spheres of hydrogen:

In the course of time approximately 4 to 20 billion, and possibly even more immense and rotating spheres of pure hydrogen occur, one of them is central situated and around it 2 - 4 more or less equal spheres (Roemer). They lie together locally in a flat plane of the universe-sphere-shell and rotate there around the greater central hydrogen sphere. That central sphere and secondary spheres consist first of liquid hydrogen that is supercritical and shaped hydrogen plasma with time. The increasing gravity holds intact and stables each of these bigger and hotter rotating pure hydrogen spheres.

Gravity rids almost completely of all existing liquid hydrogen the space between those billions hydrogen spheres on the universe-sphere-shell in a period of around 10 to 15 billion years! Only a very small portion of the vapor pressure of only hydrogen remains. (Therefore in the intergalactic space cannot be found helium or any other gas!)

From each pure sphere of hydrogen (R1) and 2 to 4 additional spheres later one galaxy will be formed then later by gravity it will be joined together into larger galaxies, the author estimates at about 4 to 20 billion pieces. (By gradual refraction of light multiple duplications occur and we think more than 100 to 150 billion galaxies can be observed)

3) Galaxies rotate faster than from a single Big Bang (= Big Bang theory) can be expected:

Gravity inhibits the expansion of the universe-sphere-shell decreasingly what is accompanied with the continued conversion of expansion velocity in angular speed with conservation of angular momentum. Therefore those first rotation volumes R1 together also make another variety of sub rotation areas in different levels. This results in the formation of 3 to 4 successive generations of increasingly larger rotation areas.

That 3 to 4 moves from the period that preceded the 4 to 20 billion hydrogen supernovae or 4 to 20 billion Big Bangs are now still present in the universe and explain the currently observed apparently too rapid rotations of all galaxies! Entraining the history they are the now explainable normal angular velocities of these galaxies! See also the period with growing population (gray) spheres prior to the Big Bangs in **figure 4a document E3-1.**

So all galaxies rotate faster than might be expected looking at the current Big Bang theory. With a mathematical model of the universe that 'too fast' rotations can be filled in quantitatively. Those 'too fast' rotations are wrongly attributed to 'dark matter' and 'dark energy'.

5.3.6 RUN-UP TO THE 4 TO 20 BILLION BIG BANGS:

1) Formation of 2 to 4 additional spheres of pure hydrogen gas:

That condensation process of hydrogen and gravity flows into the formation, to current 4 to 20 billion or more rotation areas with a central sphere of hydrogen plasma and 2 to 4 surrounding rotating smaller and cooler sub spheres of pure hydrogen plasma. Those 4 to 20 billion structures of rotating hydrogen spheres (first liquefied and then ionized by pressure and heat) are distributed completely homogeneously over the whole, always more slowly expanding universe-sphere-shell.

Ultimately each rotation area R1 results in the formation of one big super hot central sphere of hydrogen with around it 2 to 4 smaller equally big secondary spheres (Roemer) less heavy and less hot. That rotary whole is the basis of one Big Bang to the formation of 2 to 4 spiral arms which together will constitute one galaxy. The structure outlined here applies to all galaxies.

2) Double counting by a factor of 5 to 15; probably only 4 to 20 billion galaxies:

The number of rotation areas, so hydrogen spheres in the universe-sphere-shell corresponds to the total number of galaxies by the author currently estimated at approximately 4 to 20 billion ones. That is the current thought: 100 to 150 billion galaxies corrected double counts by a factor of 5 to 15. We observe many times all the universe-sphere-shell situated far away galaxies on Earth, in different places and sometimes large differences in time. Double counting is caused by any electromagnetic radiation and beam particles e.g. in the extremely low concentration of hydrogen is an extremely small deflection in the universe-sphere-shell undergo averaging approximately 1 degree every 10 to 40 thousand light-years. That is why all forms of radiation still continue to move for 100% within the universe-sphere-shell. So in fact the universe-sphere-shell is a completely closed system for matter and (radiation) energy.

Always we see the universe on all sides through this thin 'hydrogen lens' of universe-sphere-shell resulting in a completely distorted picture of the deep universe at distances of more than 10 to 20 million light-years! This remote and beautiful, spherical universe looks in reality quite different from what we observe on Earth through our splendid telescopes and other instruments! We cannot correct or eliminate this effect!

3) One central sphere of hydrogen with around 2 to 4 smaller side spheres:

In the center of each rotation area R1 finally in a period of 5 to 10 billion years one giant sphere can be found, rotating faster and faster, hotter and hotter, formed from gaseous hydrogen. Each central sphere includes along with his 2 to 4 secondary spheres (Roemer) a quantity of hydrogen corresponding to that of one whole galaxy with approximately 100 to 200 billion stars, their planets and still to form central black hole!

Outside that balls of gas liquid hydrogen is hardly present, only an extremely low vapor pressure of hydrogen (< 6 kPa) remains.

4) Going to fusion:

During the formation of these 4 to 20 billion excessively large central pure hydrogen spheres with 2 to 4 secondary smaller spheres the pressure and the temperature gradually continues to increase up to tens of millions kelvin. In the center of the central spheres at a certain moment the temperature and pressure run so high that in the center of the central spheres spontaneously fusion starts from 100% pure hydrogen plasma in which only ordinary protons and electrons are present. Any forms of radioactivity, neutrons and cosmic rays are absent. It is not to be expected that already deuterium or tritium are formed!

In the initial phase of this Big Bangs the normally for fusion in stars present starting mechanisms in the form of radiation and particle radiation are missing completely. That is why this hot pure hydrogen is delayed to fuse so much more time. If once the fusion process started running this process directly out of control.

(At the start of the later to be formed stars, radioactive elements, and cosmic radiation are really present. They act as catalyst of the fusion process. As a result, starting the fusion process in which subsequent star much earlier and at a much lower pressure and temperature, and those fusion run much more controlled than in this gigantic central pure hydrogen plasma globes.)

5) Those billions Big Bangs happened much earlier than 13.8 billion years ago:

These billions of Big Bangs must be much older than 13.8 billion years. Beyond the 13.8 billion light-years from our current event horizon of the universe already completely functioning galaxies are available. It takes approximately 7 to 12 billion years before this point after the local Big Bang is reached.

The better exact timing of those Big Bangs can be derived in principle from the half-lives of the radioactive elements formed at that Big Bangs. The author assumes that all Big Bangs happened approximately 20 to 25

billion years ago. The radiation of these billions of literally for us blinding Big Bangs extinguished anyway for ages.

6) The current age of the universe:

In the **documents G7** (universe cycle) and **G8 (Figures universe cycle)** the author derives that the present universe should have started 40 to 45 billion years ago with one super cold Little Bang explosion without any form of radiation.

Only about 20 to 25 billion years later and about 20 billion years ago that 4 to 20 billion Big Bang explosions happened; one at the start of every galaxy. See **note figure 4a E3-1** in which the start of the universe cycle is shown in short. Those billions of Big Bang explosions are not noticeable any more. Billions of Big Bangs must have occurred some 20 billion years ago. Then the current universe must be 40 to 45 billion years old. Anyway the present universe is much older than thought in 2015.

From Earth via infrared with the Planck satellite we can observe into celestial history approximately 18 billion years. (**Point 7 figure 4a E3-1**). Through light and the Herschel space telescope this time is up to 13.8 billion years (→) and by cosmic radiation 5 to 10 billion years (paragraph 10). Via infrared Planck looks further back in time than Herschel through light!

5.3.7 THE 4 TO 20 BILLION BIG BANGS:

1) Start of the nuclear fusion and Big Bang:

In all central hydrogen spheres at some point throughout the exact same time the spontaneous fusion process start. A lot of heat is released. Because these hydrogen spheres are completely oversized this fusion process runs directly out of control.

2) 20 to 25 billion years ago 'Big Bang' was an explosion of 4 to 20 billion 'smaller' Big Bangs:

The nuclear fusion process in this central pure hydrogen spheres debouches directly into 4 to 20 billion giant *pure* hydrogen supernova explosions within only a couple of minutes. All happened simultaneously 20 to 25 billion years ago. Today's scientists collectively call this happening *one* Big Bang.

So in fact that *one* Big Bang is actually a collection of 4 to 20 billion separate 'smaller' Big Bangs at the same moment. Each of them is the basis of the formation of a galaxy.

The radiation of billions of hydrogen supernova explosions or Big Bangs of the central hydrogen spheres are not any longer perceptible because it passed the earth long ago and thereby in the meantime released photons are rematerialized into protons and electrons to hydrogen atoms, molecules and possible even new stars.

3) Formation of elements of the Periodic Table from hydrogen via an intermediate stage of one or four electron pairs in the outer electron-shell:

During supernova explosions of excessively large hydrogen spheres larger atoms or higher elements will be built via nuclear fusion and under conditions that the universe still expands with many hundreds of km/s and each central sphere of hydrogen has been subjected to 4 to 5 forms of rotation which at present all protons and electrons That is why there is quite a lot of *added kinetic energy* due to velocities/acceleration of atoms in the universe.

During the fusion process from the hydrogen plasma (only protons and electrons) higher atoms are composed. Then as many as possible of the *added kinetic energy* is transformed into heat so that shell-electrons of the new isotopes around their nuclei always can traverse as energetically ideal as possible orbits.

That primarily means:

- a) formation and placement of all shell-electrons in electron pairs and
- b) secondary placement of these electron pairs in electron-shells or orbitals consisting of one electron pair or placement in tetrahedron up getting 4 electron pairs.

4) During Big Bang fusions the mini/max 1 principle must be obeyed

That fusion process during which billions of Big Bangs happens compelling with the *min/max 1 principle* of the author. The first version of the *min/max 1 principle* has been worked out in the frames 5 and 6 of **document B1** and is currently development under the recent **document F1f**. This general and fundamental *min/max 1 principle* states that all nuclear and other physical processes and also (bio) chemical reactions still occur through simple steps, each of at least one and no more than one physical change or a single chemical one.

The *min/max 1 principle* also applies during fusion for the construction of single atoms from protons and electrons from the hydrogen. At the time of the nuclear fusions in the Big Bangs only available particles can act, so neutrons do not play any part!

Each fusion step is split into three simple possible types of steps from *min/max 1 principle*:

- a) the binding of a free electron from the plasma becomes a nuclear-electron; (electron capture);
- b) the placement of one free electron in the electron-shells becoming a shell-electron.
- c) the binding of a single proton from the plasma to one of the nuclear-electrons. In one of the previous step that nuclear-electron was attached to one of the outer protons of the nucleus.

5) During fusion only two combinations of placement of protons and electrons are possible:

Nuclear fusion takes place under the strict condition of electrical neutrality which fusion happens over just two fixed combinations:

- 1) (1n.e + 1p): bonding of an electron to one proton already existing in the nucleus (nuclear electron; n.e) followed by the bonding of one new proton to this last annexed electron.
- 2) (1p + 1s.e): attaching one proton to one of the already available nuclear electrons followed by placing one electron (shell electron; s.e) in one of the existing electron-shells.

See appendix I and II.

I) Formation new isotopes:

Via once (1n.e + 1p) through a second (1s.e + 1p) after the other the composition of the electron-shells changes. These (1n.e + 1p) fusion steps only result in a heavier isotope of the atom.

A total of two or four separate steps occur.

II) Formation of new elements:

Through the combination of the first fixed once (1n.e + 1p) followed by one (1p + 1s.e) takes place a change in the composition of the electron-shells. These combinations results in the formation of higher elements. In total here four separate steps happen.

That building process of atoms and their isotopes happens in phases and universe widely in exactly the same manner and results for energetic reasons standard in accordance with the isotopes of the periodic table as shown in the table of isotopes. See **figure 18, 19 and 20 and appendix I and II.**

(The author replaces all neutrons by one nuclear-electron (n.e) and one 'nuclear-proton' (p). This gradual construction applies universe wide mandatory for all elements present there and their isotopes are everywhere exactly equal to the isotopes that are found on earth!

During the fusion always as much as possible of the previously named *added kinetic energy* is converted into heat so that the atom itself always has the least possible *added kinetic energy* (by the 9 – 11 velocities of the earth in the universe)!

5.3.7.1 FILLING IN OF THE ATOMIC NUCLEI DURING FUSION:

-1) Ad a / b) The filling of the nucleus with one proton and one electron are alternated:

Under the prevailing enormous high temperature and pressure, all the nuclei collected from the hydrogen atom built up gradually during these hydrogen supernovas and be filled in synchronism the electron-shells. This is done alternately with either:

- I. attaching of one nuclear-electron or one proton (1n.e + 1p) in combination with
- II. attaching of one proton and one shell-electron (1p + 1s.e)

In this way in the meantime the electron-shells are filled stepwise with one shell-electron.

During the fusion process, the charge of the new nucleus is getting +€ or --€ plus the charge of the previous nucleus according to the law of conservation of charge. In the nucleus during that fusion step process following the *min/max 1 principle* no neutron is formed or can be formed! See **appendix I.**

The formation of each isotope in the periodic table can be reduced in this way to a few simple steps to add either a proton or add one electron to the nucleus or one electron to the shells. See the table of isotopes where the author replaces each neutron by one proton and one nuclear electron. **Figures 18 a - 18 n, 19 and 20.**

On the basis of the table of isotopes that nuclear fusion process can be followed step by step and in detail. This Big Bangs and then occurring fusion fully compliant by the author derived and generally applicable *min/max 1 principle*.

2) Bonding of nuclear-electrons at two or three protons:

In the nucleus normally any nuclear-electron is bound standard to a minimum of two protons. However a small part of the nuclear-electron is bound to three protons. These nuclear-electrons hang between those three protons in a stable equilibrium position.

Average nuclear-electron is bound to at least two protons; see **figure 18a – 18n, 19 and 20** and **appendix I** for the step-wise buildup of nuclei to element aluminum (Al).

The composition of the higher elements follows the same system and sequence. There are slightly more nuclear-electrons needed to keep the nucleus stable with charge bonds. This buildup occurs widely universe uniformly. The nuclei of atoms and their isotopes are widely universe identical in structure. Via *min/max 1 principle* (**document F1f**) that build-up and development of all isotopes of the periodic system can be followed step by step.

3) No formation of neutrons in the nucleus:

During the fusion process, the protons are not linked to only one nuclear-electron. Then it would be formed so that a neutron from popping off immediately. In the nucleus cannot really neutrons are formed as bond between only one proton and one electron!

In the nucleus the proton is bound to 0 electrons (the H atom), to a single proton (only in the *free* neutron) or more and at least two or more nuclear-electrons. Only in free neutron is the binding between one proton and one electron!

4) Atomic nuclei are positively charged:

During that building all nuclei are increasingly positively charged. That is quantitatively compensated by placing electrons in orbits around the nucleus.

5.3.7.2 FILLING OF THE ELECTRON-SHELLS DURING FUSION:

-1) Ad c) The filling of the electron-shells:

In mathematical descriptions are made beautiful pictures of atoms called electron-clouds. Quantum mechanics and those nice pictures gave rise to largely abandon the classical model of atoms. Unfortunately, when interpreting these photographs in quantum mechanics itself, no account is taken of the effects of 9-11 different accelerations of the earth relative to C which act on every atom on Earth and elsewhere in the universe spherical shell subject. Those velocity's have profound impacts for the entire atom and especially for the shell-electrons.

Because of those velocity's in universe shell-electrons cannot move any more in ideal orbits around the nucleus of their atoms. All kinds of deviations from the desired ideal path of the shell-electron caused by velocity's of the atom in the universe. Those shell-electrons attempt to correct these deviations by generating all kinds of physical and chemical forces and their bonds. By forming bonds bonding heat is released.

The current science, especially quantum physics do not at all take account of the 9 – 11 velocity's of the earth in the universe and the resulting forces and structures in bonds with 9 – 11 vectors!

The shell-electrons move with about two thousand km/s around their nuclei and within each orbit in different directions. These movements cannot be achieved in more 'static' electron-clouds and are only possible if there are really clearly distinguishable band-shaped or spherical electron-shells around the nucleus. That results in the same photos. By reason the author continues of the old and still not outdated vision of their electron-shells and orbitals by Bohr. See **Figures 1a, 1b and 1c document E3-1**.

During fusion reactions in the hydrogen supernovas the universe wide building of higher atoms happens uniformly and the same characteristic gradual filling of first maximum 2 shell-electrons (the K shell) and later the grow to 4 electron-pairs arranged in the form of a kind of tetrahedron structure. During the entire fusion process, the total charge of the newly-formed atom remains between +€, 0 or -+€.

-2) (Sub) shells with one electron pair or with up to four electron pairs:

For energetic reasons the filling of the K shell happens to a maximum of one electron pair. When filling of the next electron-shells with electron *pairs* K(1), L(4), M(9), N(16), O(9), P(4) and Q(1) the filling of this outer

electron-shells and their orbitals always happens via an intermediate step with a filling, which still consists of sub layers of:

- a) of the second shell-electrons in the form of one pair or
- b) shell of 8 electrons or in the form of a tetrahedron with four electron pairs. Also this can be introduced as a cube with eight corner points at an equal distance, which together form four electron pairs. With each electron pair are both electrons as far away as possible from each other.

(In between the atomic nucleus is built up in increments of increasingly with one proton and one nuclear-electron)

During fusion acceleration in the universe and thus "added" kinetic energy of the atom are responsible for the universe wide exactly the same structure of the electron-shells and their orbitals in the elements of the periodic table. Through the formation of one single electron pair or of tetrahedrons with four electron pairs during nuclear fusion reactions both spatially and energetically is realized the most ideal filling of the various (sub) electron-shells with electron pairs, and as much as possible the 'added' kinetic energy is converted into heat. For example, the newly-formed atom always achieves the lowest possible energy content and minimum use of space. That gradual process of building the electron-shells universe goes wide at the exact same way!

-3) Construction of new electron-shells:

Is the outer shell of the atom once filled up with 1 or 4 electron pairs follows a further filling of the more inwardly situated (sub) electron orbits, to the extent that is spatially and energetically possible. Only then during the fusion process of these hydrogen supernovae will be started with the formation and construction of a new outer electron-shells with orbitals which are filled up again to a tetrahedron of four electron pairs, etc., after which a further padding happens of more inner (sub) electron-shells.

Only when further fill the inner electron-shells has been completed is started again during the fusion process the construction of the following new outer electron-shell is started and filled again with sub layers of one electron pair and eventually up to 4 electron pairs etc.

This fusion process with alternating the stepwise construction of new outer electron-shells and subsequently filling up the more inwardly located electron-shells process continues until the formation of atoms with $Z > \# 92$ and proceeds from the energetic point of view seen universe wide in an identical manner with maximum filling of the shell and sub shells: K shell (1), L shell (4), M shell (1, 4, 4), N shell (4, 4, 4, 4), O shell (1, 4, 4), P shell (4) and Q shell (1). The number of pairs of electrons per shell and orbital are in brackets

This step-wise filling of the electron-shells via the above-mentioned intermittent process of filling during the supernova explosions of the atomic nucleus and of the electron-shells results universe widely in exactly the same typical structure of the electron-shells in accordance with the elements in accordance with the periodic table of elements with in principle always 8 elements per layer. This is primarily the result of the filling of the outer electron-shell of the smaller elements with increasingly four electron pairs.

5.3.7.3 REDUCTION OF THE NUMBER OF THE FUNDAMENTAL FORCES TO TWO ONES:

Anno 2015 is subject to a system of four fundamental forces in science: a) the strong nuclear force, b) the electromagnetic force, c) the weak force and d) gravity.

The electromagnetic force is divided into a) an elementary electric charge force and b) a weak magnetic spin force which in addition to mass already incurred at Higgs level. See my **document F1a 2014**.

In the nucleus with protons and nuclear-electrons the "strong nuclear force" is replaced by the electric charge force and the "weak force" is replaced by the magnetic spin force. Then the "strong nuclear force" and the "weak one" will be deleted completely.

Gravity is generated by the shell-electrons in combination with the velocity of the atom in the universe versus center and also zero level for gravity energy. So gravity is not an elemental force; see **document F1a 2014!** Gravity is very important in the cycle of the universe.

Thus the author reduces the current system of four fundamental forces to only two basic forces: the electric charge force and the magnetic spin force / bond!

5.3.7.4 CONSTRUCTION OF THE ISOTOPES IN THE PERIODIC SYSTEM EXACTLY THE SAME UNIVERSE WIDE:

1) During fusion and everywhere the construction and filling of the electron-shells is exactly the same:

Universe wide the filling of the electron-shells (and nuclei happens mandatory for purely energetic reasons, in exactly the same way. The fusing hydrogen atoms in the hydrogen supernovas are subjected to enormous accelerations within the universe-sphere-shell.

Throughout the fusion process this fusing shell-electrons and protons at each step consistently endeavor to a state with as little as possible "added kinetic energy" by these protons and electrons 'added' energy as much as possible directly into heat!

2) Throughout the universe-sphere-shell atoms are constructed in accordance with the isotopes table:

That structure of isotopes is shown in the table of [Wikipedia](#). It is valid and applicable universe widely and with the difference that the author replaces each neutron by one proton and one nuclear-electron! In his view, all isotopes are constructed with only two instead of three building blocks.

5.3.7.5 NUCLEAR FUSION in the CENTER of BIG BANGS FORMATION CENTRAL BLACK HOLES:

1) Creation of isotopes with $Z > 25$ (from iron):

In the center of these hydrogen supernovas and central hydrogen spheres atoms are mainly formed between $Z = 26$ (Fe) and No. 92 but also atoms $>$ number 92 which are very unstable themselves. In the middle part of the supernova fusion region can be formed predominantly stable and unstable isotopes $<$ # 92. In the outer fusion region the fusion roughly stops at the lighter elements $<$ 26 (Fe). In the most outer edge of the fusion region is not much further than number 20 (argon) with the elements Si, Na, Ca, Mg O, N, and S. This outer edge is blown off there from, and the future galaxy is formed.

2) All hydrogen supernovas universe wide evolve in the same way and almost simultaneously:

All 4 to 20 billion pure hydrogen supernovas or 4 to 20 billion Big Bangs occurred simultaneously and result mandatory everywhere in the formation of atoms in accordance with the elements of the periodic system and their isotopes by the well-defined and the stepwise filling of both the electron-shells via tetrahedrons as the nucleus.

With all hydrogen supernovas universe widely this leads to exactly the same characteristic arrangement of the elements in layers of 8 ones in the periodic table and compelling to the same structure of atoms conforms exactly to the elements of the periodic table as we know it on Earth.

Also in the hydrogen supernovas large quantities of unstable isotopes are produced. They stabilize still further in the coming billions of years through radio activity through emitting a) neutrons (one proton with one electron together), b) alpha particles ($4p + 2e$) and c) beta particles ($1e$) and the like. Because of this fusion and radioactive isotopes, the nuclear fission starts to form in the later stars much earlier and at much lower temperatures and pressures.

3) Creation in all the galaxies of a central black hole:

In the center of the hydrogen supernovas the nuclear fusion of hydrogen is accompanied by massive accelerations and velocities of the newly formed atoms. The electron pairs of all the elements generate the van der Waals/London force (+ $W2f$). This van der Waals/London force is related to kinetic energy, and thereby takes quantitatively quadratically increases / decreases with the velocity of the atom in the universe.

Already during those hydrogen supernovas being Big Bangs the accelerations/velocity's of rotation and thus the electron pairs generated by the van der Waals/London forces are so great that these forces within the newly formed isotopes proceed to the formation of van der Waals/London bonds (+ $W2b$).

This is done both inside the electron-shells and between (sub) electron-shells themselves. Through these van der Waals bonds (+ $W2b$) inside the atom the electron-shells of those newly formed higher, atoms collapse directly thereafter until near their atomic nucleus.

The core of the fusion area in all 4 to 20 billion hydrogen supernovas (Big Bangs) transforms immediately afterwards into one very big, very fast rotating black hole with a radius of about ten to twenty thousand kilometers. This central black hole is created very shortly after these hydrogen supernovas, Big Bangs. At the core of all the currently observable 4 to 20 billion galaxies such a central black hole is present without any exception.

4) Central black holes contain approximately 13% of the originally been fused hydrogen:

All of these central black holes present in all galaxies are equal big everywhere! It represents an equivalent of approximately 13% of the originally present hydrogen fused the first time and then it transformed into higher elements > beryllium and eventually transformed into black-hole atoms.

At the outside of the fusion region, especially the lighter elements of the periodic table < Fe with approximately 2% of the already fused hydrogen is blown away as well as elements to no. 92, and also a possible outer layer of the central sphere with not yet fused hydrogen. By the loss of gravity and the force of the explosion those 2-4 side bulbs without fusion are thrown and by the released heat of the Big Bang converted in plasma which is blown for each sub sphere in one direction in which the 2 - 4 arms the galaxy are formed.

During those 4 – 20 billion Big Bangs in total approximately 15% of the hydrogen fuses of which 2% is emitted along with a total of approximately 85%, not fused hydrogen mainly from the 2 to 4 side spheres.

In fact that blow during these hydrogen supernovae / Big Bangs of ancillary spheres effected a tangent *) at the universe-sphere-shell. Thereby eventually the explosion area gets the shape and size of one flat system within the universe-sphere-shell with a radius of approximately fifty thousand light-years eventually. Within this is going to form a galaxy.

*) See **step 15 and 16 universe cycle G7 document with figures in G8**. What is designated as one Big Bang in the year 2015 was in fact step 16 of the universe cycle with 4 to 20 billion hydrogen supernovas; now on earth no longer perceptible.

5.3.7.6 CREATION OF GALAXIES, STARS AND PLANETS:

1) Formation of stars and planets by cooling and condensation:

The during supernova hydrogen swept away radioactive debris after cooling the explosion area by gravity and adiabatic expansion cake together to between 100 and 200 billion celestial bodies with a size of larger "planets" and smaller ones which all contain highly radioactive elements because all kinds of unstable isotopes are formed at this Big Bangs.

After cooling condensed and liquefied gases drip down on these debris. Still further cooled to the condensation point of hydrogen liquid hydrogen falls to these chunks, and also in the end as the last it 'rains' even liquid helium.

Ultimately in each 'Big Bang' being a pre-galaxy between 150 and 200 billion rather large liquid gas / plasma spheres are created around a core containing several highly radioactive elements. No longer pure hydrogen spheres, pre-stars, are extremely much smaller in size than the previous 100% pure hydrogen spheres.

Those second generation gas balls which consist mainly of hydrogen around a solid core with partially unstable and highly radioactive material. In addition to the central black hole with cooled hydrogen to its condensation point, each supernova or big bang area eventually arise between 100 to 200 billion liquid plasma shaped pre-stars with their accompanying planets which have some liquefied hydrogen whatever results in the formation of planetary *gas-giants* which, without exception, all possess a core having higher radioactive isotopes. Depending on the pressure and temperature radioactivity results in star formation. In many cases caused by gravity double stars.

2) Fusion start much earlier in stars:

The intense radioactivity introduced in the core of such a hot plasma-shaped pre-star, in contrast to the pure hydrogen supernovas, in a much earlier stage already to start of the nuclear fusion process in the hydrogen at much smaller spheres and at a much lower temperature and pressure. So that fusion process in stars is much smoother and more controlled than in the previous hydrogen supernovas. The fusion starts forming (double) stars and their accompanying planets. Each galaxy has approximately 100 to 200 billion stars and accompanying detected planets.

However the formation process of galaxies and their stars along with their accompanying planets is very wide uniform structured.

3) Stabilization through ejection of nuclear particles:

Through nuclear fission and stabilization of the atoms by emitting α particles (helium nuclei; $4p + 2e$), β particles (fast electrons) and γ particles, loose neutrons ($1p + 1e$) all formed atoms stabilize universe wide and

end to the same about hundred elements of the periodic table as they are known on Earth and in our solar system, displayed in the table of isotopes.

4) The approximately hundred elements can be divided into four groups of elements:

Obtained by any fusion with hydrogen after many steps in between over 92 different elements and a multitude of unstable isotopes (see an Isotope Table) via radioactive decay eventually pass through a radioactive series in stable elements and their universe widely ultimately approximately hundred pieces stable.

Those naturally occurring stable isotopes can be divided into the following groups:

- 1) metals (+ m +)
- 2) amphoteric metals (+ m -),
- 3) metalloids (- m +) and
- 4) halogens (- m -).

- The H atom has unique features but looks most like a metal (+ m +)

- Noble gases react only under extreme conditions and then they also react as a metal (+ m +).

Eventually all elements are divided into four basic groups.

5.3.7.6.1 THE ORIGIN OF COSMIC RADIATION:

-1) Origin of cosmic rays:

After 4 - 20 billion hydrogen supernovae or Big Bangs, who happened 20-25 billion years ago, all there formed black-hole-atoms (many conditioned as atoms bigger than uranium) were located in the central black hole of the galaxy. Those black-hole atoms are inherently unstable. These black-hole-atoms try to stabilize themselves by radioactive decay:

-) nuclear fission in some black-hole atoms is not possible or

-) decay by for example alpha particles or helium nuclei (4 p + 2 n.e), electrons (1 n.e) and neutrons (1p + 1 n.e).

However in a black hole state this stabilizing of the nucleus is very difficult because these unstable nuclei are totally contained within their electron-shells, in which the electrons move with the speed of light near and around the nucleus. See **document F1e**.

In black holes this decay of unstable black-hole atoms succeeds only if:

- a) the black-hole atoms are on the outside of the black hole and
- b) these released particles have an extremely high energy.

Ad a) The decay of black-hole atoms and stabilization of black holes goes very slowly in time. These highly energetic particles explain part of the continuous present high energy cosmic rays. This radiation is partly due to the formation of galaxies, nuclear fusion in stars and stabilization of isotopes in stars and planets.

Ad b) A second source of high-energy radiation is composed of photons getting faster rotating going to the formation of rotor photons or formation of matter in the context of the universe cycle. Eventually this results in the formation of protons and electrons, hydrogen, fusing of elements \geq beryllium and the eventual inclusion of all matter and energy in the central black hole of the galaxy or in that of any of the billions of other central black holes; see **document F1c**.

2) All the isotopes in the universe generate the same system of forces:

During hydrogen supernovae all atoms in the universe are mandatory sorted according the periodic table known on earth. So all similar ordinary isotopes in the universe show exactly the same set of physical forces and chemical ones as known on Earth (see Chapter 6).

Within universe-sphere-shell these forces and their bonds locally can differ quantitatively in the number of force components and binding ones that depend on the number of velocity's that any object makes within the universe-sphere-shell relative to C. The local magnitude of the forces and bonds may be different quantitatively also.

The number of relevant velocity's/accelerations in the universe (most of the times 9 to 11) can make differences in those force components and bond ones in different galaxies! The results of this theory are not yet observed in the consequences of the current astrophysical research and quantum mechanics and the analysis of celestial spectra.

5.3.8 TARGET OF THE CURRENT STEP 23 OF THE UNIVERSE CYCLE:

1) Step 23 of the universe cycle:

The current on-going step 23 of the universe cycle aims:

- all previously radiated and to still radiate photons and other cosmic radiation to change into protons and electrons, and then hydrogen and through nuclear fusion the elements helium and lithium.
- to let transform all remaining hydrogen, helium and lithium into the elements beryllium (Be) and higher through nuclear fusion;
- (it means) to prepare all now existing lower elements to make them suitable for inclusion in the central black hole present in the center of each galaxy,
- After 200 to 250 billion years at the end of the current step 23 all forms of radiation from the universe-sphere-shell must be disappeared except gravity. Therefore step 23 lasts very long.
- At the end of this step 23 in the meantime the expansion rate of the gravity universe-sphere-shell is reduced to zero. All the expansion energy in the universe-sphere-shell is then converted into gravity energy and into rotational energy that is concentrated completely in the billions of central black holes.
- Then all by stars emitted radiation is locked again as matter in one of the 4 to 20 billion central black holes.
- Only when the above has been fully realized and all mass, matter and energy has been trapped into central black holes, the expansion of the universe-sphere-shell ends.

5.3.9 END OF THE EXPANSION OF THE UNIVERSE-SPHERE-SHELL AND END OF CURRENT STEP 23 UNIVERSE CYCLE:

1) Expansion is getting slower:

After 150 to 250 billion years from now, the expansion of the universe-sphere-shell will stop completely. In the meantime, all hydrogen has been fused and all galaxies disappeared into their central black hole and their previously emitted radiation returned into one of the billions central black hole for 100%.

All expansion energy is converted into gravitational energy and rotational one. That is why the equatorial speed of those central black holes rises 100 to 150 thousand km/s; the same rate as the launch of the expansion.

At the end of the expansion, all axes of rotation of the central black holes net again just focus on the center C.

After this maximum expansion the universe starts to shrink under the influence of *rotation-gravity* weather everywhere with the same speed simultaneously towards the center C of the universe.

2) The elements H, He and Li cannot enter the black hole condition and must fuse first to \geq Be:

The isotopes of hydrogen, helium and lithium possess only at most one electron pair and that is why they cannot collapse into black hole isotopes and therefore cannot be incorporated into a black hole. The lightest elements to fuse to at least beryllium before they can do it. Black-hole atoms are ordinary atoms whose electron-shells collapsed by high external pressures and by the formation of van der Waals/London bonds inside the atom.

Only isotope with two or more electron pairs can collapse into black-hole atoms. Virtually all photons are 'squeezed out' and ejected from the nucleus and from the electron- shells of the atom. The temperature of black-hole atoms decreases to near absolute zero, and presumably 2.7 kelvin. Black-hole atoms are literally completely shriveled versions of ordinary atoms \geq Be.

During the collapse of the atom the original vibration energy of the nucleus has been converted into kinetic energy of the electrons in the (sub) electron-shells. This way shell-electrons get velocities around the nucleus of the speed of light. Due to that all electron pairs disintegrate into single shell-electrons so the van der Waals/London forces (-W2f) and bonds (-W2b) disappear.

The collapse of ordinary atoms to black-hole atoms is irreversible. During the next Little Bang, all black-hole atoms again divide into an equivalent number of protons and electrons.

The electron-shells of black-hole atoms have basically the same structure as in ordinary atoms but now contain only single electrons. The sub layers of 1 or 4 electron pairs remain with black-hole atoms also in position because in the sub shells the electrons move in different directions. During the collapse of ordinary atoms almost all absorbed photons to the atomic nucleus are squeezed out and removed leaving black-hole atoms very cold with a temperature of circa 2,7 kelvin!

3) Black-hole-atoms and black holes are super cold:

With the electron-shells situated directly around the nucleus the nucleus can virtually cease to vibrate. This makes such black-hole atoms physically near absolute zero. That applies also to all complete black holes and other compact celestial bodies. Because of extremely low temperature a black hole cannot emit light and

virtually infrared but still gravitation, infrared (2.7 kelvin) from the surface and high-energy cosmic particle radiation! The black holes cannot emit light due to the temperature and not due to heavy gravity!

4) Formation black-hole atoms only from beryllium:

The formation of such van der Waals/London bonds (+ W2b) inside the atom can only occur if the atom contains at least two electron pairs. That is the case with all of the elements of the periodic table from beryllium (Be) all of which contain two or more electron pairs (2). The position of the electron shells with respect to the atomic nucleus, and the speed of the shell-electrons can be calculated theoretically.

All ordinary matter and all matter in a black hole state in the universe are made of protons and electrons.

Ordinary isotopes are sorted according to the periodic system of ordinary atoms from the element H.

For atoms in a black hole state, however, a similar periodic table of elements into a black hole state that starts from the element beryllium (Be) and the same number of electron-shells and orbitals which are filled with only single electrons. Electron pairs are no longer possible. The K, L, M, N, O and P shells and orbitals remain intact and are now coming face near the nucleus and are together!

5) Super giants are probably a black hole:

In some places in our Milky Way super big stars occur. Would those super giants consist entirely of hydrogen the fusion process would completely degenerate and turn into a sort of local Big Bang. Those superstars are very heavy and yet exhibit the normal fusion process of stars indicates that within these stars a local black hole is present, which finds itself only 2.7 kelvin in default! Unbelievable!

6) End of galaxies:

After 150 to 250 billion years all the galaxies lost their fusible matter and will disappear into the central black hole. All previously emitted radiation transformed back into matter through star formation and also included in this central black hole. The universe will be cold and completely dark. Then the universe-sphere-shell moves under the influence of gravity contraction again towards the center C of the universe.

5.4. THE UNOBSERVABLE PART OF THE UNIVERSE AND THE UNIVERSE CYCLE:

-1) First billions of years the universe-sphere-shell expands without temperature and gravity:

The new universe starts with a super cold Little Bang which is settled at 0 kelvin! After the Little Bang for a period of 5 to 10 billion years the expanding universe-sphere-shell contained only single protons and single electrons and lacked atoms and molecules. This made the universe-sphere-shell expand with 100 to 150 thousand km/s. That whole period was without temperature and gravity. See **note points 0 -7 figure 4a document E3-1**. The first approximately 20 billion years of the universe cycle settled in 15 steps until the billions big bangs is not any more noticeable due to this super cold start of the new universe.

-2) With the formation of hydrogen, temperature and gravity come back in the universe:

Only 5 to 10 billion years after the Little Bang from protons and electrons at first only the hydrogen atom arises and thus gravity and temperature return into the universe-sphere-shell. During the formation of hydrogen bonding heat is released and the temperature is at most a few thousands of kelvin. That temperature is completely overshadowed by the extreme temperatures of the later occurring 4 to 20 billion Big Bangs that all radiation transformed back into hydrogen and in new stars. That period to the Big Bangs is not to be observed. (Contrary to what you might expect the formation of the hydrogen atom is not accompanied by a UV flash)

3) Period of 4 to 20 billion Big Bangs is not observable:

Some 20 billion years after the Little Bang 4 to 20 billion super hot hydrogen supernovae occurred, one for each ball of hydrogen gas. Each of these billions of hydrogen supernovae or Big Bangs (step 16 of the universe cycle) underlies the formation of one galaxy. Only from then a universe is created that in principle is visible with telescopes and other astronomical instruments. However those 4 to 20 billion Big Bangs which happened approximately 20 to 25 billion years ago and they are not any longer visible with telescopes or otherwise perceptible again. This also applies to the steps 16 to 22 of the universe cycle. Even the first approximately 7 billion years from the beginning of the current step 23 of the universe cycle is not to get observable.

The radiation of light, infrared and matter particles released by those Big Bangs remain invisible. In the interim time and long ago the mentioned radiation transformed back into protons, electrons, hydrogen and that hydrogen through cooling and condensation is again transformed into new stars.

4) Universe Cycle can be modeled mathematically:

The universe cycle of 29 steps meets the *min/max principle*. Therefore all the previous 22 steps can be traced back and the future steps can be filled in completely also. All steps of the universe cycle can be modeled mathematically. For the qualitative description of all the 29 steps, see **document G7 (text) and G8 (figures)**. In **document E3-1** and **Figures 4a, 4b, 5 and 6** is the universe cycle described in brief. After modeling all steps will be filled quantitatively in detail.

5) The observation horizon in the universe-sphere-shell for light is ‘only’ 13.8 to 14.0 billion years:

Probably all electromagnetic radiation can wander in the universe-sphere-shell only up to 13.8 billion years. In the time between all forms of radiation can be transformed back into protons, electrons, and hydrogen. Therefore practically from Earth we cannot look back further than about 14.0 to 13.8 billion light-years. This distance is our event horizon for light. The 4 – 20 billions of Big Bangs, we no longer perceive. The author estimates the period of the Big Bangs now at about 20 billion years after the Little Bang and 20 to 25 billion years ago.

Infrared applies a longer residence time of approximately 18 billion years and for particle radiation only approximately 5 to 10 billion years before they are transformed back into protons. That 18 respectively. 5 to 10 billion years literally shapes our perception horizon for infrared radiation and particle radiation. Modeling of the universe cycle should provide clarity here.

5.4.1 RADIUS OF THE UNIVERSE-SPHERE-SHELL:

-1) The universe-sphere-shell has a radius of 2.5 to 3.5 billion light-years:

Seen from Earth in this universe-sphere-shell the maximum visibility is 13.8 billion light-years in all directions. Within the universe-sphere-shell light is deflected and broken. In this way it remains in the universe-sphere-shell. So the universe-sphere-shell is filled with virtual images of galaxies and stars in all directions; maybe more images than real objects. For this reason we cannot look beyond the borders of the universe-sphere-shell. And there is not anything to admire out there because it is completely empty.

If the light is purely rectilinear universe-sphere-shell must have a radius of at least 13.8 billion light-years, because light is deflected by running all kinds of the curved paths. The radius of the universe-sphere-shell will then have to be larger. The author reckons the universe-sphere-shell is between 14 and 30 billion light-years at present. The thickness of the universe-sphere-shell is quite small compared to its radius being 5 – 10 million light-years!

Anyway our event horizon is strictly limited between 13.8 to 18 billion light-years (infrared, **See 5.4.5**) while the current universe should be already 40 to 45 billion years old. Even older part we never get to see! In the mathematical modeling of the universe cycle and the quantitative interpretation of the 29 steps will show where the physical boundaries of the universe are more exact.

5.5 MATHEMATICAL UNIVERSE CYCLE MODEL:

1) The universe cycle can be modeled mathematically because the 29 steps meet the *exactly one principle*:

In previous is to outline how the current universe (step 23) has been established and how this cycle will be completed. That process is worked out in more detail in the **documents G7 and G8**. Each step in the universe cycle has been based on the same 12 basic parameters. Every step of the 29 ones of the universe cycle and each transition to the next step will be settled on an entirely predictable way.

Every step and thus the universe cycle as a whole can be modeled physically and chemically.

On the basis of such a mathematical universe model the radius of the universe-sphere-shell, the limits of the amount of matter, energy and gravity can be derived, and the 12 parameters for the 29 steps of the universe cycle can be aligned; see **document G3**. With time, these 12 parameters always better can be matched quantitative and filled in better and better. This applies to every step and for the universe as a whole cycle.

5.5.1 MODELING REQUIRED FULL COOPERATION:

-1) Cooperation or opposition:

The universe cycle is fundamentally inconsistent with Einstein’s theory of relativity and it also indicates where this theory contradicts author’s concepts. In today’s science of relativity is the central theory. With the universe

cycle the author does not make any friend within the current science; only opponents. Initially the current sciences will gag the author.

However science cannot evade the intriguing phenomenon of the universe cycle. This theory is strictly logical and provides clear insights. The universe cycle gives answers to the most fundamental scientific issues in the year 2015. It is the nature of: a) gravity, b) dark mass / matter, c) dark energy, d) time e) space. The author solves issues integral to within one coherent theory through the universe cycle. Unfortunately at the expense of the theory of relativity!

-2) Universe Cycle modeling mathematically:

Modeling the universe cycle, called 'Taeut' cycle is scheduled to start 2015. The author appeals to ESA, CERN, the KNAW, NWO, universities and their scientific and astrophysical institutes to incorporate together that modeling of the universe cycle in their programs. After all, only through modeling is to give form quantitatively the past and the future of the universe-sphere-shell. In principle with such a model all the issues around the universe can be solved quantitatively.

With such a working universe model for any time both in the past and in the future of the universe outlined a quantitative picture against which all astrophysical measurements can be utilized. With such a model the full period beyond our event horizon can be filled quantitatively!

Unfortunately the author's vision of higgs and the universe cycle is contrary to prevailing views in the sciences and the results of the theory of relativity and elementary particle research (Nikhef, CERN, and ESA). That generates a lot of opposition to the current generation of exact scientists. Unfortunately until now they did not show to be able to deduce the universe cycle together. **The author fights to start modeling as soon as possible.**

* 6) 12 THE PERIODIC TABLE UND SYSTEM OF FUNDAMENTAL FORCES:

1) The 12 fundamental forces on matter or the elements periodic table:

In the documents C1, C2, C3 and C4, the author systematically has derived the fundamental forces that appear on the periodic table. For details, the author refers to the relevant documents. Suffice a modified and simplified representation of the fundamental forces.

The author describes the *dissolving force* and the *absorption force* as sub forms of the *van der Waals/London force* now and is binding and not as separate force. That reduces the number of forces.

For the elements of the periodic table shall appoint author now a total of 12 different fundamental forces comprising:

-) 2 basic (e) forces of the proton / electron,
-) 1 sub elementary force of the atom,

-) 2 mechanical forces of the atom,

-) 1 gravity force
-) 2 physical forces of the atom,
-) 2 chemical forces of the atom,
-) 2 the forces related to temperature.

Table 6-1: The 12 fundamental forces of the periodic table:

a) The elementary forces of the proton / electron:

- 1a) the elementary charge force of the proton (+ Lef p +1)
- 2a) the elementary magnetic spin force of the proton (Mef p +1)

- 1b), the elementary charge force electron: (+ Lef e -1),
- 2b), the elementary magnetic spin force of the electron (Mef e +1),

b) The basic sub elemental force of the atom:

- 3), the centripetal force holding the shell-electron (e) in a curved path around the nucleus: (Cpf + e),

c1) The mechanical speed forces of the nucleus:

- 4), the acceleration / deceleration force of the atomic nucleus (a): (+ Vf + a) / (Vf + a-),
- 5), the centripetal force of the atomic nucleus (a): (+ Cpf a),

c2) The base (speed) forces of the shell-electron (1) / shell electron-pair (2):

- 6) The gravity of the electron (1) / electron pair (2): (G1f +) / (+ G2f),

c3) The physical and chemical (kinetic energy) forces shell-electron (1) / electron pair (2):

- 7) the chemically covalent radical force from the electron (1): (+ R1cf),
- 8) (bio) chemical covalent charge force from the electron pair (2): (+ L2cf)
- 9) physical Van der Waals/London force generated from only electron pairs (2): (+ W2f)
- 9a) all the atoms / molecules with a flexible (fl) van der Waals/London bond or a liquid (+ W2flb)
- 9b) all of the atoms / molecules with a fixed (fi) van der Waals/London bond or a solid: (+ W2fib),
- 9c) all atoms / molecules with van der Waals force without van der Waals bond are gas/plasma: (+ W2gf)

Interactions between van der Waals/London forces in the form of a van der Waals/London bond:

- 9d) dissolving (D) of atoms / molecules in a liquid, the dissolving force electron pair (2): (+ W2Db),
- 9e) absorb (A) of atoms / molecules in a solid: the absorption force electron pair (2): (+ W2Ab),

c4) The base (kinetic energy) power outer electron-shell atom:

- 10) The charge force electron (1) / electron pair (2): (+ L1f) / (+ L2f),
- 10a) dissolving charged particles / ions in water by means of charge binding: (+ L1b) / (+ L2b),

d) The base (temperature) forces:

- d1) 11), the light force (photons) of the single electron (1): (+ Q1f),
- d2) 12), the infra-red force (photons) from the nucleus (a) and the proton: (+ Qir af).

Explanation:

- 1) Table 6-1 is a simplified version of the tables in the **documents C1, C2 and C3** www.uitewijkwinkel.eu . These tables need to be adapted and updated there.
- 2) Basically the total system of these 12 physical and chemical forces / bonds depends on just two the same elementary charge, and magnetic forces of the proton spin, and that of the electron. Those elemental forces arise already at the next level higgs mass / anti mass; see **document F1a 2014** and **F1c** on www.uitewijkwinkel.eu . The first time at the atom, there is the centripetal force.
- 3) *All* other physical and chemical forces arise only if there is the *atom*, and there are derivatives of these two elemental forces with respect acceleration of the atom relative to the center C of the universe; see the **documents C1, C2, C3 and E3** for gravitation. During the universe cycle these forces come out one by one.
- 4) The ordinary proton (= ordinary matter) and the simple electron (= in fact anti matter) are the only two stable basic building blocks of both ordinary matter as a matter of black hole. On the basis of the elementary attracting charge forces of the proton / electron, fusion step by step all the atoms and about 100 elements of the periodic table can be build up as well as any black-hole atom in black holes.
- 5) The under c1) indicated forces are generated by changes in velocity of atoms or molecules.
- 6) All under c2), c3), and c4) mentioned forces are only on the atom generated by the shell-electrons as a result of velocity/acceleration of the corresponding atom in the universe *relative to* the center C and zero point of the universe. This also applies to gravitation.
- 7) Each velocity in the universe generates its own, at which acceleration associated, *specific force component* at all under c2), c3), and c4) mentioned forces. All under c2), c3), and c4) mentioned *chemical* and *physical* forces are built up on the earth of the same number and the same force components as the number of velocity's/accelerations that the *earth* undergoes within the universe-sphere-shell relative to the origin C. This is true for all celestial bodies and the number of velocity's relative to the center C of the universe!
- 8) The number of different velocity's of the earth in the universe is approximately 9 to 11 *relevant velocity's of > 30 km/s*. Those 9 to 11 relevant movements result in 9 to 11 same force components when all the sub c2), c3), and c4) mentioned forces and anywhere within the universe-sphere-shell. Since the universe has the shape of a sphere-shell with C in the center those 9 to 11 force components are universe wide identical in nature and composition!
- 9) Those 9 to 11 velocity's/accelerations in the universe are not constant but change very slowly over the universe cycle. The under c2), c3), and c4) mentioned forces and their 9 to 11 force components and bond ones are therefore also not constant. These forces also change very slowly during the unwinding of the universe cycle.
- 10) Those extremely slow changes also apply to the *corresponding constants of nature*, also 9 to 11 sub constants to be built up!
- 11) The under c2), c3) and c4) mentioned physical forces and chemical ones only attract *the same velocity vector / force vector* at each other. Force vectors of the same power but with different velocity vectors are completely indifferent to each other. They cannot form bonds with each other! This is expressed in the *Vector-law of Uiterwijk Winkel*.
- 12) Only *the same forces and the same velocity vector of the forces* mentioned under c2), c3), and c4) can form specific physical and chemical combination components and together therewith forms of physical or chemical bonds. In forming physical and chemical bonds and every sub binding comes standard binding of heat as a sign that the amount of "added" kinetic energy is decreased and the bond forming electron pair thus fell into an energetically more favorable job. Sub binding each carries its own distinctive part in.

- 13) All *chemical and physical bonds* under c2), c3) and c4) are composed of the same number of bond vectors as the number of velocity's which the earth undergoes in the universe. For the earth is that relevant number of accelerations is between 9 and 11.
- 14) Any physical and chemical bond on earth therefore consists of many separate bond components (probably eleven ones) as the number of accelerations of the earth in the universe to C.
Here a *direct relationship* exists between astrophysics and quantum mechanics.
- 15) All the physical and chemical bonds based on the same basic structure of 9 to 11 force / bond components. This results in a fundamentally different view and approach to all forms of physical and chemical bonds.
- 16) Each individual atom in the universe *knows* through 9 to 11 discrepancies in the orbits of its shell-electrons and thereby generated 9 to 11 force / bond components and the quantitative size of these different force components, in principle, exactly where that particular atom:
 - a) in the universe is with respect to the center C/zero point and
 - b) with which set of 9 to 11 accelerations atom that is moving relative to the center C of the universe!
That's very curious!
- 17) If the current number of velocity's of the earth in the universe compared to the center C are both *qualitatively* and *quantitatively* determined are then parse all physical and chemical forces and their bonds in their force and bond components. Then, the problems in the quantum mechanics to solve quantitatively.
- 18) The astrophysics can solve the problems of quantum physics by all current accelerations of the earth to divert the universe and fill in these quantitative. In 2015 to develop mathematical model of the universe cycle of the universe is an indispensable tool.
- 19) In principle the accelerations of the earth in the universe are to deduce both qualitatively and quantitatively from:
 - a) the structure of *every physical bond* and *chemical one* at the earth; an extremely difficult task.
 - b) In the case one would know how to bring the electron shell of a hydrogen atom or a lithium one in a perfect orbit around the nucleus. This is not easy! Then the effects of the 9 to 11 accelerations of the earth in the universe will be fully compensated.
For now the mathematical modeling of the universe cycle and especially the current part of that cycle provides the best prospects. Such modeling can be realized reasonably fast within 1 - 2 years.
- 20) The *chemical covalent charge force* / bond covers all chemical reactions involving reactions with electron pairs. This includes virtually all biochemical reactions and within existing individual reaction steps.
- 21) The under d) mentioned *temperature forces* still lacks such a component structure to acceleration in the universe.
- 22) In **document C2** (www.uiterwijkwinkel.eu) the author has derived the remaining forces of the atom. For these other non fundamental forces on the atom see relevant documents forces.
- 23) The structure of bonds and divestitures see the still to be completed **document D1**.

6.1 DIGITAL DISPLAY:

- Digital system of forces and bonds; digital display of molecules:

Physical forces and chemical ones including bonds are or present (+) or not present (-) or not measurable on an atom or molecule because they cancel out each other quantitatively. If the force is observable (+ f), the force cannot be present as a measurable binding (-b) at the same time. Conversely, if the force present as binding (+ b) the relevant force is no longer discernible as such (-f) or measurable.

Therefore all the forces and their compounds are to provide in the form of a digital system again. This digital system forms the basis of the author also developed DMF/C (digital matrix physics / chemistry) scheduled for 2015.

For the forces on black-hole-atoms and anti-atoms, the author refers to the relevant document F1e website: www.uiterwijkwinkel.eu .

*** 7) CONCLUSIONS:**

- 1) Protons and electrons are the only basic building blocks of atoms and of the elements of the periodic system. These basic building blocks possess: a) mass (not a force), b) the elementary charge force and c) magnetic spin force and no other physical or chemical force!
- 2) Atomic nuclei cannot contain neutrons in the nucleus, because in the nucleus standard every electron is bound to at least two protons. In nuclei the author replaces all neutrons by one proton and one nuclear-electron. See **figure 18, 19 and 20**.
- 3) The author replaces the 'strong nuclear force' by the electrical charge force and the 'weak force' by the magnetic spin force. So two 'basic forces' disappeared.
- 4) The author reduces the system of four fundamental forces to only two elementary forces:
a) electric charge (force) and b) magnetic spin (force). Both elemental forces alongside (anti) mass already generated at higgs level. (On higgs level gravity cannot be generated)
- 5) In nuclear fusion reactions are all the atoms, nuclei and shell-electrons incrementally built up from hydrogen successively by the placement of either one electron or either one proton in the atomic nucleus or in the electron-shells. All nuclear fusion reactions happen within the general *minimum/maximum 1 principle* of Uiterwijk Winkel and has been elaborated in **document F1f**.
- 6) For energetic reasons that construction of atomic nuclei and the electron-shells happens mandatory step by step in accordance with the table of isotopes where the author replaces each neutron in the nucleus by one proton and one nuclear-electron.
- 7) Atoms arise gravity and the other physical forces and chemical ones mentioned under c) only if those atoms move with velocity's relative to the center C and zero level point of the universe. This is a completely different explanation for the occurrence of physical forces and chemical ones on the atom.
- 8) The system of all the mentioned forces is the same universe widely.
- 9) The physical and chemical forces of the shell electrons and their bonds consist of 9 to 11 vectors. They are quantitatively related to the 9 to 11 velocity's *) of the atom relative to the center C of the universe. (* Not accelerations; in universe these are almost zero!)
- 10) Gravity is *proportional* to the velocity of the atom in the universe. The other physical and chemical forces of the shell electrons are *proportional to the square* (and kinetic energy) of each relevant velocity vector.
- 11) Quantitative differences may occur because of values-which depend on: a) the number of local velocity's of the atom relative to the center C of the universe and b) by local quantitative differences in the velocity's.
- 12) The astrophysics can solve the current problems in the quantum physics by the current 9 to 11 velocity's of the earth in the universe relative to C and to fill these velocity's quantitatively.
- 13) The current velocity's of the earth in the universe are the simplest and fastest traceable through modeling of the universe as a whole cycle and, in particular that part or step 23, in-which we are located now.

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