

THE STRUCTURE OF THE PHYSICAL / CHEMICAL FORCES AND BONDS IN RELATION TO SPEEDS OF ATOMS IN THE UNIVERSE:

■ According to Uiterwijk Winkel, all matter in the universe is based on only four 'low-energy' elementary Higgs particles (F1a 2014 www.uiterwijkwinkel.eu).

With these four Higgs particles, only four stable forms of matter and anti-matter can be formed:

- 1) the proton,
- 2) the anti-proton,
- 3) the electron and
- 4) the anti-electron - with their elementary characteristics of:
 - a) matter or anti-matter,
 - b) positive or negative electric charge,
 - c) parallel or anti-parallel magnetic spin and
 - d) volume.

All other forces in nature are related to the *atoms* and the *speed of the atoms* in the universe.

■ Protons and electrons form atoms and molecules. In the universe and for energetic reasons, all atoms are built up according to the elements of the periodic table. These elements generate, throughout the universe, the same system of physical, chemical and mechanical forces as on earth.

■ The two elementary forces are related to charge and spin. The non-elementary forces and their bonds are related to the atom. These non-elementary forces are caused by:

- a) the velocity of the atom in the universe relative to the *center C of the universe* and the *rotational centers R1 of galaxies*. These physical and chemical forces are only generated by the 'shell' electrons of atoms.
- b) changes in the speed/velocity or the direction of that speed. These forces are primarily generated by the atom nucleus relative to the electron shells of atoms.

■ The structure of the *non-elementary* physical and chemical forces and their bonds are related to the 5 – 9 / 11 velocities of the atom locally or to that of the celestial body in the universe. The 5 – 9 may be 11 speeds/velocities are more or less the same throughout the universe-spherical-shell.

■ The different types of *velocities* of the atom in the universe generates its own force component in the 'shell' electrons of the atom. All the physical and chemical *forces* of the elements of the periodic table on earth, are based on the same structure of components. These forces and their bonds show the same number of components / dimensions when compared to the 5 - 9 / 11 speeds of the earth / celestial body in the universe!

■ Only the components of the same force (and speed) can attract each other or form bonds or repel each other. This is stated in the Component Law by Uiterwijk Winkel.

■ The structure of the physical and chemical forces and their bonds on earth, is a direct reflection of the 5 – 9 / 11 movements / speeds of the earth in the universe. These 5 - 9 / 11 dimensions are found on the level of atoms / molecules and is also present in all measurement tools. On the Higgs / strings / snares level, only three rotational dimensions apply! Under normal circumstances, these dimensions are not measurable!

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***1) INTRODUCTION:**

The universe follows an energy-neutral cycle of 29 steps / phases during a period of 2,5 – 3,5 trillion (10^{12}) years. See **Documents G7 (Cycle of the Universe)** and **G8 (Figures)**.

This universe started approximately 40 – 45 billion (10^9) years ago with a super cold Little Bang (0 Kelvin!) without $E = mc^2$! See **Document G6** www.uiterwijkwinkel.eu . At that moment, through the loss of all gravity, the Little Bang black hole, which contained all matter and kinetic energy of the universe, became unstable and directly fell apart into an *equal number* of free protons and free electrons which then arranged themselves in 1 : 1 monolayers. All protons and electrons are real particles (**F1c**).

Approximately 5 - 10 billion years after the Little Bang, hydrogen was formed from the protons and electrons. About 20 – 25 billion years after the Little Bang gravity gathered the hydrogen in 4 – 20 billion or more large hydrogen bulbs and hot spheres. The temperature and pressure became so high that spontaneous fusion started which was followed by a superhot Big Bang. (**phase 16 of the cycle of the universe**). Each galaxy started with its own Big Bang either without $E = mc^2$!

1.1) ATOMS AND THEIR ISOTOPES ARE BUILT FROM PROTONS AND ELECTRONS:

The 4 - 20 billion Big Bangs started from pure hydrogen plasma. Thus, at the moment of the superhot Big Bangs, only protons and electrons were present. All the atoms which were formed from hydrogen, are built up mandatorily from protons / electrons throughout the universe. Atoms do not contain neutrons in their nuclei. During the nuclear fusion reactions, the atoms which are formed are constructed and arranged according to the elements / isotopes of the periodic table. See **Isotope Table Wikipedia**. With regard to the energy, all the atoms have the same structure and generate the same elementary and basic physical, chemical and mechanical forces throughout the universe. See **Document F1d**.

- The nuclei of the atoms are based on protons and electrons; they do not contain neutrons:

In **Document F1d**, the author has simplified the Atomic Model of Bohr by replacing all the neutrons in the nucleus, with one core proton and one 'core'-electron! See **Isotope Table Wikipedia and Figures 20 – 23 Document F1d**.

The structure of all atoms / isotopes is now solely based on protons and electrons! These two building blocks of the atoms possess, in addition to their mass / matter and volume, only two elementary forces:

- a) electric charge and
- b) magnetic spin.

-The 'core' electrons and 'shell' electrons of the atoms:

The atoms which do not have neutrons, however, have electrons in two positions: a) as the '*shell*' electron or b) as the '*core*' electron in their nuclei. The structure of the atomic nuclei is therefore much simpler than is the case of protons / neutrons and 'shell' electrons.

In this way, the forces and bonds in the atomic nucleus *are only based on electric charge and magnetic spin*! The strong and weak nuclei forces are eliminated! (The 'strong nuclear force' in the atomic nucleus is actually a strong charge force / bond between protons and electrons. The 'weak nuclear force' is actually a weak magnetic spin force / repelling). Both these vague 'nuclear forces' disappear.

- Only two elementary forces exist in nature instead of the four fundamental forces currently used:

The basic force system of four is now reduced to only two elementary forces: electric charge and magnetic spin. All other physical, chemical and mechanical forces are generated by the atoms because of:

- a) the speed of the atom in the universe,
- b) changes in the velocity and
- c) changes in the direction of the speed!

- Restricting the structural forces and bonds on the atomic level:

In **Document D1** the author limits the structure of matter to the proton / electron and the structure of their bindings / bonds.

The Earth and all other celestial bodies in the universe / universe-spherical-shell are subjected to 5 - 9 or more different types of speed in the universe or within the universe-spherical-shell. This speed-related forces are therefore built up, both qualitatively and quantitatively, from 5 - 9 / 11 different force components; one for each kind of speed. All physical and chemical bonds are constructed with the same 5 – 9 / 11 binding / bond - components. *However, currently (2016) the 5 – 9 or more different speeds of the earth in the universe are still largely unknown.*

***2) THE PURPOSE OF THIS DOCUMENT:**

In this **Document D1**, the forces on the atoms are deduced and the construction and structure of the bonds and the mutual repelling *between the atoms / molecules* are developed. The forces and their speed-components evolve in response to the changes of the 5 – 9 / 11 movements of the atoms in the universe. These speeds have not been quantified yet.

The structure of the non-elementary physical and chemical forces of the atoms in terms of force - and binding components are directly connected to the 5 - 9 / 11 movements of the earth in the universe!

The same build-up in the 5 – 9 / 11 components applies to gravity and to the constants of nature which are connected to them.

- Quantum-mechanics and the quantum field theory are directly linked to the speeds in the universe:

The problems in quantum mechanics and the complexity of the quantum field theory are largely due to the fact that the 5 - 9 / 11 speeds of the earth in the universe are not yet known. *These speeds can only be determined by mathematically modeling the universe and the cycle of the universe!* See **Documents G6, G7 and G8.**

- There is a direct relationship between the structure of gravity, the physical and chemical forces and the speeds in the universe:

The structure of gravity and the two non-elementary physical and chemical forces on earth are directly linked to the 5 - 9 / 11 speeds of the earth in the universe. All speed-related physical and chemical forces have the same basic structure.

Therefore, all physical and chemical bonds consist of the same 5 – 9 / 11 underlying binding components. Each speed in the universe results in its own force / bond component! (A measurable difference on earth can already be noticed between the physical and chemical bonds at the equator and the same bonds at the North / South Pole. However, all atoms in the measuring equipment are influenced as well!)

2.1 A NEED TO DEVELOP A MATHEMATICAL MODEL OF THE UNIVERSE AND ITS CYCLE:

Of the current 5 – 9 / 11 velocities of the earth in the universe, approximately 3 - 4 of them have already been created in the period of 15-20 billion years that preceded the 4 - 20 billion Big Bangs of galaxies, but they are no longer detectable. These speeds are huge and hard to find, let alone be quantified.

***3) THE PROBLEM OF CONSTRUCTING THE PHYSICAL AND CHEMICAL BONDS:**

- All non-elementary physical and chemical forces and bonds are caused by the velocity of the atom in the universe:

Currently (2016), Scientists have not yet recognized the relationship between the forces on the atom and the velocity of the atom in the universe. This problem can be overcome through *quantum mechanics* and the *quantum field theory*.

Gravity, the two physical forces and the two chemical forces are only generated by:

- a) the 'shell' electrons of atoms and
- b) the velocity of the atom in the universe.

Each separate speed in the universe causes

- 1) its own deviation in the ideal orbit of the 'shell' electrons and
- 2) increases the amount of 'added' kinetic energy, caused by the speed of the 'shell' electrons.

The 'shell' electrons want to move in a perfectly circular thin orbit around the nuclei. To get rid of the deviation they generate gravity to reduce the speed in the universe by collision of objects.

To get rid of the 'added' kinetic energy through velocity, the 'shell' electrons generate two physical forces and two chemical forces to form bonds and binding energy and thus release heat (light and infrared photons).

The mechanical forces on the atom are generated by changing the speed or direction of the velocity. See

Document F1d.

- All physical and chemical bonds on earth are a perfect reflection of the movements of the earth in the universe:

In theory, the number of speeds in the universe as well as size in km/s, can be deduced from any physical and chemical bond on earth. However, such an analysis is far from simple. All the atoms in the measuring equipment, are also subjected to the basic 5 - 9 / 11 speeds of the Earth in the universe!

As the measurement becomes more accurate, the effects of these velocities of the earth in the universe will be more and more evident and will increasingly determine and even dominate the outcome of the measured results! (That is true for measurements in the context of strings and snares with their 11 dimensions!)

- Mathematical modeling of the universe and the cycle of the universe is required:

In the context of quantum mechanics, all current speeds of the earth in the universe have to be derived and also quantified accurately. This can only be achieved through a mathematical model of the universe and the cycle of the universe as described in **Documents G7 and G8**.

The universe and the 29 phases / steps of the cycle of the universe can be modelled mathematically. With such a model the complete history of the universe, and specifically the history of planet Earth, can be derived.

Furthermore, the previous 22 steps, which are no longer detectable, in the cycle of the universe and earth as well as the development of all speeds in the universe, can then also be derived.

This mathematical model also applies to the exact number of speeds and the quantitative magnitude of the current 5 - 9 / 11 movements of the earth in the universe.

When these speeds are known, one by one and quantitatively, then all the physical and chemical bonds can be quantified in detail. Each physical and chemical bond can be broken down into exactly the same 5 - 9 / 11 quantitative force- and bond components. The current problems in quantum mechanics will then, to a great extent, be solved!

With this model of the universe, all *future steps* in the cycle of the universe can also be derived. The future steps can then be filled in completely and quantitatively. Therefore, modeling of the universe and the cycle of the universe is not only necessary but also very urgent. See **Documents G6 (Super cold start with a Little Bang), G7 (Text – Cycle of the Universe) and G8 (Figures - Cycle of the Universe)**.

*4) STRUTURE OF FORCES:

1) THE TWO ELEMENTARY FORCES OF THE PROTON AND ELECTRON:

The proton and electron are the building blocks of all atoms and isotopes. These basic building blocks are based exclusively on mass, matter and two elementary forces:

Scheme 4-1: The elementary forces of protons and electrons:

- the monovalent *positively charged proton* (L+1) with magnetic spin (M+1/2) and
- the monovalent *negatively charged electron* (L-1) with magnetic spin (M +1/2),
with their two anti-forms:
- the monovalent negatively charged proton (L-1) with magnetic spin (M-1/2), and
- the monovalent positively charged positron (L+1) with magnetic spin (M-1/2).

Explanation Scheme 4-1:

- 1) Opposing charges attract each other; equal charges repel each other.
The same applies to magnetic spin.
- 2) Only mutually equal attracting forces form bonds. The total bond is build up with 5 – 9 / 11 components
- 3) The elementary forces are not build up of velocity components.

4.1 ELEMENTARY BONDS BETWEEN PROTONS AND ELECTRONS IN THE ATOM NEUCLEUS:

In the atomic nucleus, the bonds between the protons and electrons present, consist of an *attracting charge bond* while at the same time they also consist of a *mutual repelling* through the equal magnetic spin. The magnetic spin prevents the protons and electrons to come so close to each other that there is physical contact between them.

Should they touch, their rotations, which are linked to matter, will stop and it would directly result in the annihilation of both the protons and the electrons! The bonds in the nucleus are formed without any direct or physical contact between the proton particles and the electron particles. See **Figure 28 Document F1d**.

The *elementary bonds* in the atomic nucleus between protons and electrons only consist of the combination of:

- a) a strong electric charge bond and, at the same time,
- b) a weak repelling of protons and electrons through the magnetic spin.

In the simplified atomic model and the nucleus by **Uiterwijk Winkel** the 'core' electrons are normally bound to at least two protons. However, in all the nuclei (except hydrogen) at least one of the 'core'-electrons is bound to three 'core' protons. The core electron in the nucleus then, spatially, hangs between three protons! This only occurs in the first fusion step from hydrogen → helium See **Figure 20 F1d**. In other places in the nucleus the 'core' electrons are bound to only two protons!

Therefore, the 'core' electron literally forms the *cement charge* in the atomic nucleus and holds the mutually repelling protons close together. These elementary bonds in the atom nucleus are direct and straight and have a relatively simple structure.

4.2 THE BREAKING DOWN OF THE ELEMENTARY BONDS BETWEEN ELECTRONS AND PROTONS IN THE ATOMIC NUCLEUS:

When stable atomic nuclei with their elementary charge bonds are bombarded with:

- a) fast protons,
- b) fast electrons,
- c) neutrons or
- d) any other high energy matter particles,

Such particles may be incorporated into the nucleus of protons / electrons. The nucleus becomes unstable through the excess protons or electrons. The nucleus of the atom can become stable again by emitting particles of matter:

- a) alpha particles (helium nucleus consisting of 4 protons and two 'core' electrons),
- b) beta particles (fast and loose electrons) or
- c) fast neutrons (1 proton +1 core-electron) or and even more rigorous,
- d) by splitting the nucleus into two smaller nuclei each with their own electron shells.

In all of the above mentioned cases, a nuclear reaction takes place. It is the gradual breaking down of one or more elementary charge bonds in the atomic nucleus. All nuclear reactions must be broken down by a series of simple steps consisting of only one change at the same moment!

All nuclear fusion- and nuclear fission reactions follow this step by step process. This meets the **Min / Max 1 Principle by Uiterwijk Winkel**. See **Document F1f**.

4.3 THE SUB-ELEMENTARY CENTRIPETAL FORCE:

All atoms / elements of the periodic system have a positively-charged atomic nucleus which is constructed of roughly two protons on one 'core' electron. All nuclei of ordinary matter are standardly positively charged. Around these positively charged atomic nucleus, one or more negatively charged electron-shell rotate in one or more electron orbits. These electrons neutralize the positive charge of the nucleus to a net uncharged atom.

The result of the electric and magnetic forces acts as the centripetal force that keeps the electron in a more or less perfectly circular orbit. The 'shell' electron, in effect, rotates continuously at approximately two thousand km/s around the atomic nucleus.

Only if the atom is *motionless in the universe*, the centripetal force (+ Cpf e) will hold all 'shell' electrons in a *perfect circle-like* orbit around the atom nucleus. Then, the perfect orbits of the shell electron are exactly one electron thick! **Figure 1 Document E3-1** shows and describes the influence of speed in the universe on the orbits of the 'shell' electrons.

Scheme 4 - 2: The sub-elementary force of the electron:

b) One centripetal force generated by the electron in orbit around the atomic nucleus (+ Cpf e)

Explanation Scheme 4 - 2:

1) The centripetal force of the 'shell' electron manifests itself within the structure of the atom. All atoms are based on protons and electrons and the three independent variables, namely:

- 1) the electric charge,
- 2) the magnetic spin and
- 3) the derived centripetal force.

2) The centripetal force of the electron (Cpf e) is not measurable from the outside of the atom! This force cannot result in bonds nor can it generate mutual repelling.

Scheme 4 - 3: The 3 autonomous sub-elementary forces of ordinary atoms:

- | | |
|--|----------------------------------|
| a1 elementary charge force of the proton / electron: | *1) (+ Lef p + 1) / (+ Lef e-1), |
| a2 elementary nuclear magnetic force of the proton / electron: | *2) (+ Mesf p) / (+ Mesf e) |
| b) sub-elementary centripetal force of the shell electron: | *3) (+ Cpf e). |

Explanation Scheme 4 - 3:

1) Only these three *autonomous forces* are needed to maintain the structure of the atom. In the universe all atoms are based on at least these three sub-elementary fundamental forces.

2) Atoms *without any speed in the universe* generate only these 3 sub-elementary forces. The 'shell' electrons then follow a perfectly round and thin orbit around the atom nucleus. There are no electron pair nor any other physical or chemical forces.

3) The 'shell' electrons have no speed in the universe and therefore, no 'added' kinetic energy.

***5) STRUCTURE OF FORCES:**

II) NON-ELEMENTARY FORCES RELATED TO ATOMS:

When the atom is subjected to speed, a change in the speed or in the direction of the speed in the universe, then this system of three autonomous forces of the atom, is expanded with the following groups of forces:

- A) The mechanical forces originating from the *atomic nucleus in relation to the atomic shells* (see 5.1),
The mechanical forces accelerate, slow down or pull the atom around the bend.
- B) The generating of gravity by the *shell electron and the 'shell' electron pairs* in response to the speed in the universe (see 5.3.1). Gravity is primarily meant to counteract the speeds relative to *center C of the universe* or the *rotation centers R1 of the galaxies*,
- C) The generating of two physical and two chemical forces also originate from the *'shell' electrons and electron pairs* (see 5.4). These forces are primarily intended to form physical and chemical bonds by transforming the 'added' kinetic energy as a result of the speed in the universe into heat and infrared photons.
- D) Two heat related forces.(see 5.2)

5.1: Sub A) MECHANICAL FORCES FROM THE ATOMIC NUCLEUS DUE TO CHANGES IN SPEED OR A CHANGE OF DIRECTION:

As a result of the curved movements and the changes in speed the nucleus becomes eccentric inside the electron shells. To keep the nucleus as central as possible, the nucleus develops mechanical forces: **Scheme 5 – 1:**

Scheme 5 - 1: The two basic forces of velocity of the atomic nucleus (a) within the electron shells:

- c1) physical centripetal force related to the angular velocity of the atom: * 4) (+ Cf a),**
- c2) the acceleration / deceleration force (V) to changes in the speed of the atom: * 5) (+ Vf a) / (+Vf a-).**

Explanation Scheme 5 - 1:

- 1) These forces always hold the nucleus in the center of the electron shells of the atom.
- 2) With these forces no real bonds are possible. See **Appendix: Scheme B under C1.**

5.2: Sub D) BASIC FORCES OF ORDINARY ATOMS RELATED TO TEMPERATURE:

In normal atoms the atom nucleus is in the center of the different electron shells. The nucleus has enough space to vibrate between the electron shells. Depending on the temperature this vibration is soft or quick. The vibration of the nucleus / temperature depends on the amount of adapted photons (light + infra-red photons) in the nucleus and the amount of light photons absorbed in the 'shell' electrons.

At 0 Kelvin, no vibration is possible as all the photons attached to the nucleus have disappeared.

When an atom moves in the universe it means that the atom (nucleus + 'shell' electrons) has a surplus of absorbed infra-red and light photons. In fact this is kinetic energy.

-) Emitting or absorbing infra-red photons and light photons by the atomic nucleus:

The greater the absorption of photons, the higher the degree of vibration and the higher the temperature and linear or rotational speed in the universe. Emitting or binding infra-red photons only happen in the nucleus.

-) Emitting or absorbing light photons only by the shell electrons:

At a certain temperature the 'shell' electrons change orbits and emit photons of light and UV. Electrons are also present in the nucleus. This means that the nuclei of atoms are able to emit or absorb light photons as well as infra-red photons.

-) The gaseous state:

At a sufficiently high temperature, each atom / molecule is in an unattached phase in the form of a gas or plasma. Due to their speed, atoms and molecules bump against each other. Atoms / molecules which exist in the gaseous phase always show the physical phenomenon of a gas pressure related to the Van Der Waals / London force, a physical force related to the electron-pair.

Presently, it is assumed that these temperature related forces and the repelling also manifest themselves in the form of the 5 - 9 / 11 speed components of the earth in the universe.

Scheme 5-2: Temperature related forces of atoms:

d) two basic temperature related forces of the atom

d1a) one temperature related infra-red radiation / force of the nucleus: *11a) (+ Qf ira +~) / (+ Qf ira ~~)

d1b) one temperature related light radiation /force of the nucleus: *11b) (+ Qf light +~) / (+ Qf light ~~)

d2) one temperature related light radiation ‘shell’ electron (1): *12) (+ Q1k + ~) / (+ Q1k - ~);

Explanation Scheme 5 - 2:

1) Photons are Majorana particles. They are electric dipoles. See **Document F1b** and related **Figures**. All Majorana particles are real particles without any measurable: 1) mass, 2) matter, 3) charge, 4) volume and 5) spin.

2) Infra-red photons only attach themselves to or detach themselves from the protons present in the nucleus.

3) Light photons attach and detach themselves from both the ‘core’ and the ‘shell’ electrons.

4) The absorption and emission of photons is related to the elementary forces of electric charge and magnetic spin. See **Figures 18a – 18n Document F1e**.

5.3 Sub B and Sub C THE OTHER NON-ELEMENTARY FORCES AND THEIR BONDS:

All other physical and chemically forces and bonds are generated by the ‘shell’ electrons of atoms as a result of the 5 - 9 / 11 speeds of the atoms (and the earth) in the universe. These forces and bonds are linked quantitatively to the magnitude of the speeds!

Current problem: the 5 – 9 / 11 different speeds of the earth in the universe are practically unknown:

-) Deviation caused by the speed of the atom or the earth in the universe:

If the speed of *an atom* in the universe relative to *center C of the universe* and *center R1 of a galaxy* is zero, then all ‘shell’ electrons will follow perfectly round and thin orbits around their atom-nucleus.

However, as soon as the atom moves in the universe relative to the centers **C** or **R1**, the perfect orbits of the ‘shell’ electrons come to an end because all speeds of the atom in the universe are added 1 : 1 to this originally perfectly round and thin orbits around the nucleus. As a result of these speeds, the ‘shell’ electrons can never follow their ideal orbits.

All celestial bodies and their atoms move at 5 – 9 / 11 different speeds (> 20 - 30 km/s) relative to **C** and **R1**. Each of these 5 – 9 / 11 speeds in the universe are 1 : 1 superponated and added to the ideal orbits of the ‘shell’ electrons around the nuclei.

The orbits of the ‘shell’ electrons are disturbed by the speeds in the universe. In the 20th century Heisenberg was the first who noticed these deviations in the orbits of the ‘shell’ electrons. However, he could not identify the exact position of the ‘shell’ electron and had no good explanation for this phenomenon.

-) Each speed in universe causes its own deviation and adds kinetic energy to the ‘shell’ electrons:

Due to the different and angular speeds in the universe, the orbits of the shell electrons around the atom nucleus become rather vague. The exact position of the shell electron becomes uncertain and cannot be determined exactly. Nevertheless, the electron is a real particle that follows a predictable area and route if you know all the speeds of the atom in the universe! Each speed adds its own part of kinetic energy to the ‘shell’ electrons. Each velocity of an atom in the universe causes its own deviation and adds kinetic energy to the orbits of the ‘shell’ electrons of all the atoms in the universe. There are as many deviations as the number of speeds of the atoms and the Earth in the universe.

- The ‘shell’ electrons want to move in a perfect orbit:

The ‘shell’ electrons want to achieve a perfectly *circular orbit* around the nucleus 1) without any deviation and 2) without any ‘added’ kinetic energy!

To correct this deviation caused by the speed, all ‘shell’ electrons generate:

- a) gravity to adjust the deviations by reducing these speeds
- b) two physical and two chemical forces which form bonds.

By forming bonds the 'shell' electrons dispose of the 'added' kinetic energy by transforming this 'added' energy into heat bindings (infra-red and light photons).

Due to the 5 – 9 / 11 speeds of the atoms in the universe, the orbits of the 'shell' electrons show as many deviations as the number of movements of the atoms in the universe. Each angular and/or rotational speed generates its own force component and 'added' kinetic energy. See **figures 1 document E3-1**.

5.3.1 Sub B GRAVITY:

In order to reduce the speed of the atom in the universe and to reduce the deviations in their orbits, the 'shell' electrons and electron pairs generate only *one force*: gravity. Gravity itself is not deflected by mass! The purpose of gravity is primarily:

- a) to decrease the speed of the atom in the universe and to bring the speeds of atoms to a halt by collisions of objects in the universe and
- b) to bring back all matter and energy to the **centers R1 of galaxies** and finally simultaneously all matter to the **center C** of the universe for the next Little Bang. See **Documents E3 and E3-1**

The gravitational 'radiation' which is emitted, is without mass, matter, charge, spin or kinetic energy. Therefore, gravity moves with infinite speeds through the universe and is, quantitatively, an extremely weak force.

Gravity is exceptional. It is exclusively emitted by the 'shell' electrons and it is not emitted by the mass of the nucleus. Gravity is not comparable to electromagnetic radiation. Gravity misses all kind of particles; there are no gravitons! Gravity is not measurable directly! Gravity only manifests itself indirectly through invisible and unmeasurable gravitational energy!

Only the *shock waves of gravitational energy* are measurable, not gravity itself! (**LIGO, LISA project**).

-) Various forms of gravity related to speed:

- a) expansion gravity as a result of the expansion of the universe-spherical-shell,
 - b) contraction gravity, which occurs as a result of the contraction of the universe-spherical-shell in about 450 billion years. In fact this is anti-gravity!
 - c) rotational gravity as a result of the rotation of matter and objects around their own axes,
 - d) rotational gravity as a result of the rotation around a central body (this can be complex for satellites), and
 - e) thermal gravity which is only relevant at high temperatures and high velocities / speeds in the universe.
- All forms of movement are linked to the expansion of the universe. All forms of gravity are, directly or indirectly, linked to the expansion of the universe and are therefore, basically the same type.

-) 5 – 9 / 11 components of gravity and gravitational-energy:

Gravitational (force) radiation consists of as many underlying gravitational components / dimensions as to which *the atom* is subjected to in the universe. Gravity arises as a result of the 5 – 9 / 11 relevant movements of an atom / the Earth in the universe and is generated by a single 'shell' electron (1) and by an electron pair (2). Most 'shell' electrons manifest as electron pairs.

-) Different speeds of gravity and gravitational energy:

Without the presence of mass or particles, gravity moves rectilinearly through space at speeds much greater than the speed of light. Gravity probably moves with *infinite speed* straight through the universe. All gravity leaves the universe directly.

On the other hand, the *shock waves of gravitational energy* move as waves because these waves can only be transported by matter / atoms. Therefore, the gravitational waves are limited to moving at the speed of light through the universe! As a result of this restriction, they only pass through the universe-spherical-shell.

Through the movement of the atoms in the universe, all matter are mutually attracted via gravity. Through gravity all matter in the universe eventually goes back to the same origin **C** of the universe for the next Little Bang which occurs only once in about 2,5 – 3,5 trillion (10^{12}) years. Gravitational energy (= dark energy) is the driving force of the cycle of the universe.

- Anti-gravity is absent during the expansion:

At present, anti-gravity is absent in the universe. Anti-gravity will only occur in about 350-450 billion years. At that time, the universe will shrink evenly on all sides towards the **center C** of the universe. With the contraction of the universe shrinking gravity will arise.

This shrinking gravity is actually anti-gravity. This gravity will increasingly reduce the rotational speed of the central black holes and slow down the rotation until it reaches zero. This results in a *super soft Crunch*.

Scheme 5 - 3: The basic forces related to the speed of the 'shell' electron (1e) / 'shell' electron pair (2e):

c2) The basic forces related to the speed of the shell-electron (1) / 'shell' electron pair (2):

6a) the gravitational force of the single electron (1): (+ G1f),

6b) the gravitational force of the electron pair (2): (+ G2f),

Explanation Scheme 5 - 3:

1) The 'shell' electrons generate gravity and gravitational energy to reduce the speed of the atom in the universe, as much as possible, and to finally reduce the speeds in the universe to zero. This reduction is realized by collisions of celestial bodies

2) Gravity is radiation without *waves* and without any form of mass, matter, charge, spin or kinetic energy. Therefore, gravity moves straight and at an infinitive speed through the universe. The *waves connected to* gravitational energy, however, move at the speed of light!

The strength of gravity is quantitatively and linearly related to the 5 – 9 / 11 speeds of the atom in the universe.

3) The 5 – 9 / 11 speeds of the earth in the universe relative to the center **C** and center **R1** of the galaxy change extremely slowly over time. Therefore, gravity also changes extremely slowly quantitatively.

4) The corresponding constants of nature of gravity also change extremely slowly in time! These constants of nature are only constant over a period of approximately a hundred to a thousand years. This represents an extremely short period in the universe.

5) Gravity does not generate real physical or chemical bonds. Real bonds are not possible with gravity.

Each speed in the universe generates its own specific deviation in the ideal orbit of the electron shell. In the end all the orbits are the result of the sum of 5 – 9 / 11 deviations. Therefore, all the 'shell' electrons follow a kind of band-shaped orbit around the atomic nucleus. See **Figure 1 Document E3-1** www.uiterwijkwinkel.eu and **Document E3** 'Gravity force radiation on the scale of the universe'.

In addition to the deviation in the path of the 'shell' electron, it is also accompanied by adding an amount of *kinetic energy* to the 'shell' electrons.

Due to the collisions of the galaxies in the next 350 – 450 billion years, the 5 – 9 speeds will be reduced to only one rotational speed. Each collision reduces one speed! So **LISA** and **LIGO** will get very busy in the future!

-) Gravity and gravitational energy disappear during nuclear fusion in stars!:

During the **nuclear fusion** of the 'shell' electron with the atomic nucleus, the angular velocity of the electron (about two thousand km /s) decelerates to zero. This kinetic energy is released in the form of photons of infra-red radiation and light.

During the binding of the 'shell' electron in the nucleus, the gravity and related gravitational energy generated by the 'shell' electron disappears! Therefore, it seems as if the mass disappears and that this mass is converted into energy. Unfortunately, this is based on an 'optical illusion' and is fully misinterpreted!

5.3.2 Sub C OTHER PHYSICAL AND CHEMICAL FORCES RELATED TO KINETIC ENERGY:

To reduce the level of 'added' kinetic energy, the 'shell' electrons generate:

- The single 'shell' electron generates *one physical force* and one *chemical force* and
- The 'shell' electron pair also generates *one physical force* and *one chemical force*.

Scheme 5 - 4: the basic forces related to the speed of the 'shell' electron (1e) /electron pair (2e):

c3) The basic physical and chemical kinetic energy forces of the 'shell' electron (1) / electron pair (2):

- 7) the chemical covalent radical force of the electron (1): (+ R1cf),
- 8) the biochemical covalent charge force of the electron pair (2): (+ L2cf)
- 9) the physical Van Der Waals / London force generated by the electron pair (2): (+ W2f)
- 9a) all atoms / molecules with flexible (fl) Van Der Waals / London bonds or a fluid: (+ W2flb),
- 9b) all atoms / molecules with fixed (fi) Van Der Waals / London bonds or a solid: (+ W2fib),
- 9c) all atoms / molecules by the Van Der Waals force without *Van Der Waals bonds* are a gas / plasma: (+W2gf)

Interaction between the Van Der Waals forces in the form of a Van Der Waals bond:

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

c4) The basic (kinetic energy) force of the outer electron shell of the atom:

- 10) the load force single electron (1) / electron pair (2): (+ L1k) / (+ L2k)
- 10a) dissolving of charged particles / ions in water by means of a charge bond: (+ L1b) / (+ L2b),

Explanation Scheme 5 - 4:

1) The *four forces* are generated to form physical and chemical bonds. As a result, heat (infra-red and light photons) is released. This causes the 'shell' electrons to have an energetically more favorable orbit around the nucleus.

5.3.2.1 EACH SPEED / ROTATION GENERATES ITS OWN FORCE COMPONENT LINKED TO THAT SPEED:

The relatively thin universe-spherical-shell consists of 4 - 20 billion or more *facet parts* each filled with 30 – 250 or more galaxies. All these facet galaxies form the total universe-spherical-shell. In all *facet parts* the same 5 – 9 / 11 different movements and angular / rotational speeds apply relative to:

- a) **center C** of the universe
- b) the rotational **center R1** of the local galaxy and
- c) to the rotational centers **R1** of the present galaxy / galaxies and R1 's of galaxies within each of these billions of facet parts of the universe-spherical-shell.
- d) own rotation speed of the atom.

All the celestial bodies which are present in the universe undergo more or less the same 5 – 9 / 11 speeds relative to **C** and **R1** of their galaxy. All the speeds are approximately 30 km/s, but can sometimes be several 10 – 100 km/s! This is indicated by the velocities:

- 1) relative to the **center C**: $v_{C1}, v_{C2}, v_{C3}, v_{C4}, \dots v_{Cn}$. and
- 2) relative to the **center R1 of the galaxy**: $v_{R11}, v_{R12}, v_{R13}, v_{R14}, \dots v_{R1n}$.

Each atom in the universe is present in one of the 4 - 20 billion facet parts of the universe-spherical-shell and is subjected to the same 5 - 9 / 11 speeds. All the speeds in the universe are added to all the 'shell' electrons and placed on top of their own ideal orbits around the atomic nucleus.

5.3.2.2 RELATIONSHIP BETWEEN THE SIZE, SPEED AND STRENGTH OF THE FORCE:

The strength of the forces related to kinetic energy are quantitatively *quadratic* related to the speed and therefore *linearly* to the 'added' kinetic energy. In Science, gravity and the four physical and chemical forces related to kinetic energy are seen as constants. However, that is not the case!

The 5 – 9 / 11 speeds of the earth in the universe relative to the **center C** and **center R1** of the galaxy change extremely slowly quantitatively over time as well as regarding the number of speeds. Thus, not only the five forces change extremely slowly and quantitatively in strength but also regarding their bond components.

-) Constants of nature also change extremely slowly with the speeds in the universe:

The corresponding constants of nature also change extremely slowly over time in structure as well as quantitatively! These constants of nature can only be considered constants over a period of about a hundred to a thousand years. This is an extremely short period in the universe and in the cycle of the universe.

-) Direct relationship between the original forces and the speeds of an atom in the universe:

The two physical and two chemical forces of the atom are built up from as many *underlying components* as the movements of the atom in the universe. As these forces form physical and chemical bonds, each force component results in its own specific binding component.

***6) STRUCTURE OF THE PHYSICAL AND CHEMICAL FORCES:
THE COMPONENT LAW BY UITERWIJK WINKEL:**

- 1) *Different physical and chemical forces* have no relationship to each other. They are fully indifferent to each other.
- 2) *The speed components within one force* are also completely independent and indifferent to each other!
- 3) Only *the same speed component of the same force* attract each other and results in a binding or in a repelling!

-) The different basic forces related to speed and kinetic energy, discriminate against each other completely:

Physical and chemical bindings can only be formed by:

- a) *two equal forces, and*
- b) *between two similar speed components!*

This is expressed in the **Component Law by Uiterwijk Winkel**, an extension of Newton's third law of action and reaction.

- 1) relative to the **center C** : $v_{C1}, v_{C2}, v_{C3}, v_{C4}, \dots v_{Cn}$. and
- 2) relative to the **center R1 of the galaxy**: $v_{R1.1}, v_{R1.2}, v_{R1.3}, v_{R1.4}, \dots v_{R1.n}$.
- 3) relative to the other **centers R1 of nearby galaxies**: $v_{R1-R2}, v_{R1-R3}, v_{R1-R4}, v_{R1-R5}, \dots v_{R1-Rn}$.
- 4) own rotation of the atom.

Therefore, all atoms in the universe are subjected to the 5 – 9 / 11 different speeds. Each speed adds its own effect to the orbits of the ‘shell’ electrons. In order to clarify the number of speeds a model of the cycle of the universe is absolutely necessary.

6.1 MACRO STRUCTURE OF PHYSICAL AND CHEMICAL BONDS BY ‘SHELL’ ELECTRONS:

- Each type of velocity generates its own specific deviation and ‘added’ kinetic energy:

Each type of speed / rotation of an atom in the universe causes the following in a ‘shell’ electron:

- 1) a characteristic deviation in the orbit of the electron / electron pair. The degree of deviation from the ideal path is, in principle, *linear* in relation to the magnitude of the specific velocity:

- a) relative to the **center C** : $v_{C1}, v_{C2}, v_{C3}, v_{C4}, \dots v_{Cn}$. and
- b) relative to the **center R1** of the galaxy: $v_{R1.1}, v_{R1.2}, v_{R1.3}, v_{R1.4}, \dots v_{R1.n}$.
- c) relative to the other **centers R1 of nearby galaxies**: $v_{R1-R2}, v_{R1-R3}, v_{R1-R4}, v_{R1-R5}, \dots v_{R1-Rn}$.
- d) own rotation speed of the atom.

- 2) In addition, each type of velocity of the atom in the universe relative to **centers C, R1 and between galaxies** increases the level of kinetic energy of the atom, not only for the atomic nucleus but also for of each ‘shell’ electron.

- 3) Each speed in the universe generates:
 - a) its own deviation and
 - b) its own form of ‘added’ kinetic energy:

$$\text{The total kinetic energy of a ‘shell’ electron: } E_{\text{total}} = E_{\text{relative to center C}} + E_{\text{R1 of the galaxy}} + E_{\text{R1 - Rn}} \quad (1)$$

$$\begin{aligned} &= E_{\text{‘shell’ electron relative to the center C: } E_{C1} + E_{C2} + E_{C3} + E_{C4} + E_{Cn}} \\ &+ E_{\text{‘shell’ electron relative to the center R1 of the galaxy: } E_{R1.1} + E_{R1.2} + E_{R1.3} + E_{R1.4} + E_{R1.n}} \quad (2) \\ &+ E_{\text{‘shell’ electron relative to different centers R1 of galaxies: } E_{R1-R2} + E_{R1-R3} + E_{R1-R4} + E_{R1-R5} + E_{R1-Rn}} \end{aligned}$$

$$\begin{aligned} &= \frac{1}{2}m_{(e)} \cdot (v_{C1})^2 + \frac{1}{2}m_{(e)} \cdot (v_{C2})^2 + \frac{1}{2}m_{(e)} \cdot (v_{C3})^2 + \frac{1}{2}m_{(e)} \cdot (v_{C4})^2 + \frac{1}{2}m_{(e)} \cdot (v_{C5})^2 + \dots + \frac{1}{2}m_{(e)} \cdot (v_{Cn})^2 + \\ &+ \frac{1}{2}m_{(e)} \cdot (v_{R1.1})^2 + \frac{1}{2}m_{(e)} \cdot (v_{R1.2})^2 + \frac{1}{2}m_{(e)} \cdot (v_{R1.3})^2 + \frac{1}{2}m_{(e)} \cdot (v_{R1.4})^2 + \frac{1}{2}m_{(e)} \cdot (v_{R1.5})^2 + \dots + \frac{1}{2}m_{(e)} \cdot (v_{R1.n})^2 \\ &+ \frac{1}{2}m_{(e)} \cdot (v_{R1-R2})^2 + \frac{1}{2}m_{(e)} \cdot (v_{R1-R3})^2 + \frac{1}{2}m_{(e)} \cdot (v_{R1-R4})^2 + \frac{1}{2}m_{(e)} \cdot (v_{R1-R5})^2 + \frac{1}{2}m_{(e)} \cdot (v_{R1-Rn})^2 \quad (3) \end{aligned}$$

$$= \frac{1}{2}m_{(e)} \times \sum v_{(C1-Cn)}^2 + \frac{1}{2}m_{(e)} \times \sum v_{(R1-Rn)}^2 + \frac{1}{2}m_{(e)} \times \sum v_{(R1-Rn)}^2 \quad (4)$$

This kinetic energy ‘added’ to the *mass* of the ‘shell’ electron / electron pair increases, in principle, *quadratic ally* to the speed / rotation $v_{(1-n)}$ whereby *n* is the number of possible movements in the universe relative to **C** and **R1** of different nearby galaxies.

This is the number of at least 5 – 11 measurable dimensions found in the string/snare theory! These dimension are not present at the Higgs / string / snare level! These dimensions which have been measured, are all present at the *atomic level* due to the great number of velocities of the earth in the universe!

In the universe, the earth is subjected to 5 – 9 / 11 different and measurable speeds of which each can be 10 – 100 km/s. In addition to the considerable deviations, this also results in large quantities of 'added' kinetic energy quantitatively. The 'added' kinetic energy causes deviation from the ideal orbit *indirectly*.

The 'shell' electrons try to minimize the amount of 'added' kinetic energy as much as possible by transferring this energy into heat. For this purpose, the 'shell' electrons generate two physically and two chemically forces which form bonds.

These are the basic forces of kinetic energy. Each of the 5 - 9 / 11 external speeds / rotations of the atom within the universe-spherical-shell thereby generates its own characteristic *velocity and force components* of the four generated forces.

- Effects on Quantum mechanics and the Quantum field theory:

All physical and chemical bonds in the universe consist of as many bond component as the number of speeds of the earth / celestial body in the universe.

The forms of these physical and chemical bonds is usually associated with the release of binding energy in the form of heat. This forms the tangible proof that during the formation of the bond, a part of the 'added' kinetic energy of the 'shell' electron or 'shell' electron pair is converted into photons of light and infra-red (heat) radiation. Each sub-binding makes its own specific contribution to this bond and part of the bonding heat.

By forming physical or chemical bonds, the 'shell' electrons get into an energetically more favorable position and more ideal orbit. Paragraph **c3 and c4** show the total of 4 forces which forms, without exception, physical and chemical bonds in which standard binding heat (photons) is released.

***7) SUMMARY:**

1) All mass and matter in the universe are based on only 4 Higgs particles:

- a) the two most basic Higgs particles of the proton and
- b) the two most basic Higgs particles of the electron, which only generate
 - 1) mass,
 - 2) elementary charge force,
 - 3) elementary magnetic spin force and
 - 4) volume /space.

2) Building protons and electrons:

The process of building protons and electrons follows a path with neutrinos (2 – 4 Higgs), photons (6 Higgs) and quarks (27 Higgs). Protons and electrons are based on the constructions of (81) Higgs. See figures **F1c**.

By adding $E = \frac{1}{2} mc^2$ to the rotational / angular energy the transformation occur from mass → matter or anti-matter. See **Document F1c**. The proton and the electron are the maximum possible stable final products of these 4 Higgs particles.

Protons and electrons have six elementary characteristics: 1) mass, 2) matter, 3) electric charge, 4) magnetic spin, 5) a spatial form with an associated volume and 6) a fixed basic internal quantity of kinetic energy. The proton and anti-proton, and the electron and anti-electron are built up exclusively from the 2 x 2 Higgs particles. See **Documents F1a (2014), F1b and F1c**.

3) The protons and electrons form neutrons but they are not even stable in the atom nucleus:

The proton and electron only form ordinary atoms according to the periodic table. See the **Isotope Table Wikipedia**. In the simplified periodic table the author has replaced all the neutrons in the atomic nuclei with a single proton and one 'core' electron. The strong nuclear force becomes a strong electric bond; the weak nuclear force becomes a weak and repelling magnetic spin. See **Document F1d and Figures**.

4) The forces can be qualitatively demonstrated and quantitatively measured:

All other *non-elementary* forces in nature are completely matched to the atom and the velocity of the atom in the universe. This system of forces and bonds is deduced from the atom and the speed of the atom in the universe and it can be logically explained. All forces which are deduced can be demonstrated and measured as physical or chemical parameters.

5) The system of physical and chemical forces / bonds by Uiterwijk Winkel, is totally logical and consistent and related to the processes in the universe:

The usefulness of the atom when creating a physical and chemical bond, lies in the conversion of the 'added' kinetic energy, caused by the speed in the universe, into heat (photons). As a result the electrons (1) and / or electron pairs (2) which are involved, become lower energetically and, hence, in a more favorable orbit around their nuclei.

6) Non-elementary forces consist of as much force components and bond components as the number of speeds of the Earth in the universe:

Each form of speed generates its own force component from a basic force (speed / kinetic energy). Each atom generates as many speed components as the number of movements of the atom in the universe. A bond component can only be created between a force and the exact same force component. Each physical and chemical bond on earth, consists of as many bond components as the number of 5 – 9 / 11 movements of the earth / the atom in the universe.

7) Not all speeds of the Earth in the universe or the speed components are known, neither are their size!

Approximately 3 - 4 speeds and also the force components date back from the period prior to the Big Bangs about 20 – 25 billion years ago. That period of about 15 – 20 billion years cannot be observed any longer.

The earlier movements of the Earth in the universe can be deduced theoretically from the binding structures inside the molecules and crystals. All physical and chemical bonds have the same *complex structure*.

8) A Model of the universe will show all movements quantitatively and the basic structure of all bonds:

By developing a mathematical model, all the velocities of the earth in the universe can be deduced and be clarified quantitatively and thus, also the basic structure of the physical and chemical bonds on earth.

9) The speeds in the universe change in number and quantity extremely slowly over time:

During the cycle of the universe minimal changes in the 5 – 9 speeds occur continuously. These changes in the speed can be predicted by making a mathematical model. With such a model the quantitative changes in the speeds and therefore also the changes in the speed components of both gravity as well as the components in the structure of all the related forces (kinetic energy) and their bonds in the past as well in future, can be made known!

This has had profound implications for the frequency of all the radiation emitted by matter in the past.

In the next 350 – 450 billion years through collisions of galaxies, the 5 – 9 /11 speeds will be reduced to only one rotational speed of the final super black hole of the facet which will be build up from the 30 to about 250 or more current galaxies.

10) All non-elementary forces and constants of nature change very slowly over time:

During the cycle of the universe all the relevant velocities within their part of the universe-spherical-shell continuous to change in time. Therefore, the speed / kinetic energy related to the forces of the atoms and their underlying strength component, change very slowly in time. This also means that the related natural constants change very slowly in time!

These constants are only constant for a moment.

The natural constants associated with the mass, the elementary charge and the elementary magnetic spin of the proton / electron are the only real constants and they do not change in time. All other forces and associated constants are only constant for a moment and change continuously but extremely slowly.

The latter has far-reaching and profound implications for astrophysics and the processing and interpretation of the signals that reached earth from billions of years ago.

11) Effects on emitted light / radiation frequency:

The number of speed component and the number of strength components and thus the number of components in the physical and chemical bonds currently present inside a single atom, are different from that of the same atom billions of years ago! This has had an effect on the frequency of the light emitted over the past millions to billions of years.

12) One speed component is added on the moon:

On earth all atoms have the same number of speed components even though there are differences in the measurements at the equator and at the North / South Pole. The atoms on the Moon possess one more speed component than the atoms on Earth. Due to the relatively small difference in the velocity of the Earth in the universe compared to the Moon, the extra component is hard to determine.

8) CONCLUSION:

1) In the universe, the elementary forces, electric charge, and magnetic spin of the proton and the electron can only build up the elements of the periodic table. During the cycle of the universe the mass, matter, electric charge force and magnetic spin force and their bonds can be considered as constants and therefore also the associated elementary constants of nature. These quantitative values not only apply to the preceding universe but also to the next cycle of the universe.

In **Appendix Scheme B** the author shows the 12 different elementary and non-elementary forces of the atom.

2) The *non-elementary* a) gravity, b) two physically and 3) two chemically forces are generated by the 'shell' electrons of the atoms as a consequence of the linear and / or angular velocities of the atom in the universe. These forces and their constants of nature are related to the speed of the atom in the universe.

3) These forces, their bonds and the constants of nature consist of as many underlying speed-components as the 5 – 9 different speeds of the earth in the universe.

4) If the current 5 - 9 / 11 speeds of the earth in the universe are known, then gravity, gravitational energy, all physical forces and all chemical forces on earth can be construed into the 5 – 9 / 11 force- and binding-components. By modelling the universe and cycle of the universe all speeds in universe can be identified and quantified. With that information all problems in quantum physics and the quantum field theory can be solved!

5) Only gravitational components which are equal can attract each other. The other components are completely indifferent to each other. The attraction and formation of bonds also apply to the two physically and two chemically forces. This is explained in the *Component law* by **Uiterwijk Winkel**.

6) During the cycle of the universe the 5 - 9 / 11 speeds of the earth in the universe change quantitatively and extremely slowly in time. This extreme slow change also applies to all the force components of gravity, gravitational energy as well as the two physical and two chemical forces and their binding components.

7) The forces which are linked to the constants of nature also change quantitatively in time! These constants of nature are not real constants of nature. These constants are only temporarily constant!

8) Physical and chemical bonds are possible between the basic kinetic energy forces which are generated by the 'shell' electrons(1) / electron pairs(2) in orbits around the nucleus of the atom. The quantitative magnitude of the basic forces related to kinetic energy is directly proportional to the 'added kinetic energy' of the atoms and their 'shell' electrons ($\frac{1}{2}m_e.v^2$). This is the direct result of the linear and angular speeds of *the atom* in the universe.

9) During the formation of physical and chemical bonds, binding energy / heat (infra-red and light photons) are released. Through the construction of these bonds, the 'shell' electrons attempts, as much as possible, to transfer the 'added' kinetic energy of the electron / electron pair into heat / photons. In this way it can create the ideal orbit around the nucleus.

10) All the physical and chemical bonds in the universe are caused by the same 5 – 9 / 11 velocity dimensions. This number is equal to the number of speeds of the earth / celestial body in the universe within the universe spherical-shell. *All physical / chemical bonds have the same complex composition and structure.*

11) By modeling the cycle of the universe mathematically, the 5 – 9 / 11 speeds of the earth / celestial body in the universe can be deduced. Therefore, all the physical and chemical forces and their bonds on earth can be broken down through quantum physics into their 5 – 9 / 11 components / dimensions!

12) Only 3 rotational dimensions are possible at the level of Higgs particles! These dimensions cannot be determined quantitatively outside the Higgs particles. The current measured 10 – 11 dimensions of the string / snare theory *are anyhow not present* at Higgs level!

13) The observed and measured 10 – 11 dimensions are located at an atomic level. They are present in all atoms / molecules of the measuring equipment used! The dimensions are the result of the speeds of all the atoms on earth in the universe! For the springs / snares they are, in fact, measurement errors!

Mr A.P.B. Uiterwijk Winkel MSc

Zwijndrecht, The Netherlands, 22 December 2015 / 20 October 2016

APPENDIX: OVERVIEW OF THE ELEMENTARY AND NON-ELEMENTAARY FORCES OF NATURE:

The 12 fundamental forces on matter and the elements of the periodic table:

In **Documents C1, C2, C3 and C4**, the author systematically derived the *fundamental* forces generated by the atoms of the periodic table. (Absorption of solids and dissolving in a real liquid (= condensed gas) are now considered to be sub-forms of the Van Der Waals / London force / bonds.

Scheme A: Overview of the elementary and non-elementary forces in nature:

For the elements of the periodic system the author names a total of 12 different *fundamental* forces comprising of:

- two elementary (e) forces of the proton / electron (*Paragraph 4*),
- one sub-elementary centripetal force of the 'shell' electron relative to the nucleus (*Paragraph 4*),

- two mechanical forces of the atom, (*Paragraph 5*),

- one gravitational force of the 'shell' electrons of the atom (*Paragraph 5*),
- two physical forces of the 'shell' electrons of the atom (*Paragraph 5*),
- two chemical forces of the 'shell' electrons of the atom (*Paragraph 5*),
- two temperature related forces. (*Paragraph 5*),

Scheme B: Two elementary, one sub-elementary and nine fundamental force elements of the periodic table:

a) The two elementary forces of the proton / electron:

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

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

b) One sub-elementary force of the atom:

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

c1) Two mechanical speed forces of the atomic nucleus:

- 4) the acceleration / deceleration force of the atomic nucleus (a): (+ Vf + a) / (Vf + A-),
- 5) the centrifugal force of the atomic nucleus (a): (+ Cf a),

c2) Two basic speed related forces of the 'shell' electron (1) / 'shell' electron pair (2):

- 6a) the gravity of the single electron (1): (G1f +),
- 6b) the gravity of the electron pair (2): (+ G2f),

c3) Three basic physical and chemical forces related to the kinetic energy of the 'shell' electron (1) / electron pair (2):

- 7) the chemical covalent radical force of the single 'shell' electron (1): (+ R1cf),
- 8) the bio-chemical covalent charge force of the 'shell' electron pair (2): (+ L2cf)
- 9) the physical Van Der Waals / London force generated by the 'shell' electron pairs (2): (+ W2f)
- 9a) all the atoms / molecules with flexible (fl) Van Der Waals bonds or a liquid: (+ W2flb)
- 9b) all the atoms / molecules with fixed (fi), Van Der Waals bonds or a solid: (+ W2fib),
- 9c) all the atoms / molecules with Van Der Waals force but without bonds which are gas / plasma: (+ W2gfb).

Interaction between the Van Der Waals 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) absorption (A) of atoms / molecules as a solid: the absorption force electron pair (2): (+ W2Ab),

c4) The basic, kinetic energy related, force of the outer electron shell of atoms;

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

d) The basic, temperature related, forces majoranas /neutrino's and photons:

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

Explanation Scheme B:

1) **Scheme B** is an updated version of the tables in the **Documents F1c, F1d** www.uitewijkwinkel.eu .

2) The whole system of 12 physical and chemical forces / bonds is based on only two of the same elementary electric charge and magnetic spin forces of the proton, the electron and the atom.

These elementary forces already occurred on the Higgs level through kinetic energy and thereby caused three rotations of the Higgs particles around their longitudinal axes and two front axes. The three rotations occur in three deformations. As reaction to these deformations, the Higgs particles generate:

- 1) mass or anti-mass,
- 2) positive or negative electric charge and
- 3) parallel or anti-parallel spin.

See **document F1a 2014 and F1c** www.uitewijkwinkel.eu .

3) The atom generates the centripetal force. This force is more or less independent of the speed of the atom in the universe, just as the electric charge and magnetic spin.

- 4) All other physical and chemical forces are generated by the speed of the atom in the universe. Gravity is directly linked to the deviation of the ideal orbit.
The two physical and two chemical forces are related to kinetic energy. By forming bonds these forces try to convert the 'added' kinetic energy into heat. In doing so, the electrons obtain the best possible orbits around the nucleus. During the cycle of the universe, the energy related forces appear one by one. See **G7**.
- 5) The proton and the electron are the only two stable basic building blocks of both matter and black hole matter. The periodic table and thus the forces in nature are the same throughout the universe.
- 6) The forces indicated under c1) are caused by a change in the velocity of the atoms or molecules and a change in the direction of the speed (angular velocity).
- 7) The forces c2), c3), and c4) are only generated by the atom of the 'shell' electrons, and is the result of the speed / angular speed of the corresponding atom in the universe *relative to* the absolute zero point and the **center C of the universe and centers R1 of galaxies**. This also applies to gravity.
- 8) Each speed / angular velocity in the universe generates its own *specific force component* which are associated with that speed of the forces c2), c3) and c4) which have been deduced.
The *chemical and physical forces*, deduced from sub-c2), c3) and c4), are built up from the same number and similar force components on earth, as the number of movements of planet *Earth* within the universe-spherical-shell relative to the **origin C** and the **center R1 of our galaxy**. This also applies to all other objects and all types of black holes in the universe and the number of movements relative to the **center C of the universe and the R1s of galaxies!**
- 9) The number of speeds of the earth in the universe amounts to 5 – 9 / 11 *relevant speeds*; each of which are > 20 - 30 km / s. The 5 - 9 / 11 relevant movements result in 5 – 9 similar force components regarding the forces c2), c3), and c4). All the atoms within the universe-spherical-shell have the same 5 - 9 / 11 force components and therefore the same nature and composition.
- 10) The 5 - 9 / 11 velocities in the universe are not actually constant. They change extremely slowly during the cycle of the universe. The forces deduced under-c2), c3), and c4) and their 5 - 9 / 11 force-components as well as their 5 – 9 / 11 bond components and related bonds, also change extremely slowly. See **G10**.
- 11) As a result of the very slow quantitative changes of the forces under c2), c3) and c4), the *related constants of nature* also change. The constants of nature are built up from the 5 – 9 / 11 sub-constants of nature!
- 12) Regarding the physical and chemical forces of c2), c3) and c4), only *the same forces with the same velocity components / force components* can form an action-reaction pair. Different force components from one force are completely indifferent to each other. They cannot form bonds between themselves!
This is explained in the *Component Law* by **Uiterwijk Winkel**.
- 13) Only *the same forces and the same speed component of the forces* mentioned under c2), c3) and c4) can realize specific physical and chemical binding components.
Heat is released during the formation of physical and chemical bonds, as well as sub-bindings. This indicates directly that the amount of 'added' kinetic energy has been reduced and the bond-forming electron pair has fallen into an energetically, more favorable orbit. Each sub-bond plays its own part in the total amount of heat released (light- and infrared-photons).
- 14) Each physical and chemical bond on the earth, therefore, consists of as many separate binding components, as the number of movements and velocities of the earth in the universe relative to the **C** and the **R1** of the galaxy and the R1s of nearby galaxies. A direct relationship exists between astrophysics and quantum mechanics!
- 15) All the physical and chemical bonds in nature are based on the same basic structure of 5 - 9 binding components. This results in a fundamentally different outlook on and approach to all forms of physical and chemical bonds.
- 16) Each individual atom in the universe '*knows*', in principle, through these 5 - 9 / 11 discrepancies in the orbits of its 'shell' electrons and the generated 5 - 9 / 11 force / binding components as well as the quantitative magnitude of the different force components, exactly:

- a) where that particular atom is in the universe-spherical-shell relative to the **center C** of the universe and relative to the center **R1** of its galaxy,
b) which set of 5 - 9 / 11 rotational speeds this atom moves in, in the universe relative to the **C** and **R1** and **other R1s of nearby galaxies!**

This is not only curious but also bizarre!

17) When the current range of speeds of the earth in the universe, relative to the **C** and **R1s**, are both *qualitatively* and *quantitatively* determined then all the physical and chemical forces and their bonds can be construed in their force and bond components. Then, the problems in quantum mechanics and the quantum field theory can be solved quantitatively.

18) Astrophysics can solve the problems of quantum mechanics by diverting the current velocities of the earth in the universe and to fill them in quantitatively. Developing a mathematical model of the cycle of the universe is of the utmost importance now (2016) and will be an indispensable tool.

19) The movements of the earth in the universe can, in principle, be derived both qualitatively and quantitatively:

- a) from the structure of any *physical* and *chemical* bond on the earth; an extremely difficult job.
b) when the 'shell' electron of a hydrogen atom or a lithium atom is placed in a perfectly circular orbit around the atomic nucleus. This is not easy! In this case, the effects of the 5 - 9 / 11 movements of the earth in the universe to be neutralized and compensated for. Such a test set-up is not without any danger!

20) The best option is to provide a **mathematical model** of the universe and cycle of this universe and especially the current part of the cycle. This modeling of the universe / cycle of the universe can be achieved within 6 to 18 months.

21) The *chemical covalent loading force* / binding covers all chemical reactions involving reactions with the electron pairs. These include nearly all *biochemical reactions* and the individual reaction steps. These reactions occur mainly between molecules constructed from the elements C, H, N, O, S and P.

22) The *temperature forces* are lacking regarding the component build-up of speeds in the universe.

23) In **Document C2** (www.uitervijkwinkel.eu), the author derived the remaining non-fundamental forces of the atom.

24) Physical and chemical forces and bonds of an atom or molecule could be: a) present (+) or b) they are not present (-) or c) the forces are not measurable since they cancel each other out quantitatively. If the force is observed, then (+f) this force cannot simultaneously exist as a measurable binding (-b). Conversely, if the force is present as a binding (+ b), the corresponding force is no longer perceptible (-f) nor is it measurable.

25) However, the forces and their bonds can be presented in a digital system in a *digital matrix*.