A Model that leads to **new knowledge**

Second Module: the evidence

T/Q E Ex	**Theorem-Question** **Explanation** **Example**	**From an experiment to the understanding** Given the degree of difficulty of this Module, the useful parts will be repeated in the following Modules.

Text Module = in black, version of present Physics = in red

We finished Module 1 by the theorem that the charges of electrons and protons that compose atoms can release energy. How come we did not notice before? Perhaps because alongside the official Physics there exists another kind of Physics. This is in the form of inexplicable and yet repeatable experiments that some scientists rather would not see.		
E	Justified or unjustified claims on the internet.	The internet is buzzing with claims about energy from vacuum or ZPE. Sometimes those claims are dealing with magnet applications, others do it with watergas and others even claim the existence of low energy fusion processes. In this Module we pick out one of those opportunities and we are going to explain this claim, which is justified in our eyes, with the conclusions of M1.
Q	Which claims are reliable?	The repeatable claims. For any kind of science being repeatable remains an absolute criterion!
Ex	Randell Mills Black Light[1] Radiation In his research lab at the Eindhoven University physicist Professor Gerrit Kroesen has just generated a plasma in a vacuum tube surrounded with cords and equipment. The bright blue glow that blares out through the window in the test set hurts your eyes. Kroesen looks like a novice magician that has just delivered a successful trick. He knows: what happens in the vacuum tube cannot be real according to Physics.	The recipe for this intriguing experiment is simple. Take a tungsten filament. Put it in a cylinder of hydrogen, under very low pressure of 0,001 atmospheres, and put some grains potassium in. Turn the heating coil at 70 volts and wait for the glowing tungsten is at a temperature of more than a thousand degrees Celsius. Accordance to ordinary Physics not much special will happen. The potassium will evaporate and the molecular hydrogen (H2) is split up into separate H-atoms by collisions with the hot coil. However, in the lab, there suddenly occurs a plasma. The temperature of the hydrogen shoots up to four hundred thousand degrees, thus suggests the spectrum of the light that comes from the window. And high energy ultraviolet light is emitted, with a wavelength of 10 to 150 nanometer which appears to be secondary, emitted after a collision. Plasma normally occurs only at much higher temperatures, or at a much higher voltage than 70 volts. There should also not be the extreme ultraviolet light under given the circumstances. Moreover, the extreme ultraviolet light contains frequencies that are rather enigmatic.
E	Interpretation of Randell Mills	The Rydberg unit of energy R_y = 13,6057 eV appears in the calculations of Niels Bohr concerning the binding energy of an electron in a hydrogen atom and $E_n = R_y/n^2$ and n = 1, 2, 3, 4, … being the quantum numbers. Randell Mills claims that these quantum numbers in his experiment are divisible whereby the hydrogen atoms shrink (formation of hydrino's). For example with the transformation of H → $H^*_{1/3}$ with quantum number n = $1/3^e$ an energy of 108,8 eV is released. With the transformation of H → $H^*_{1/4}$ this gives an energy of 204 eV. This theoretical vision conflicts with a lot of concepts of the present

[1] TU Delta 23 nov 2006

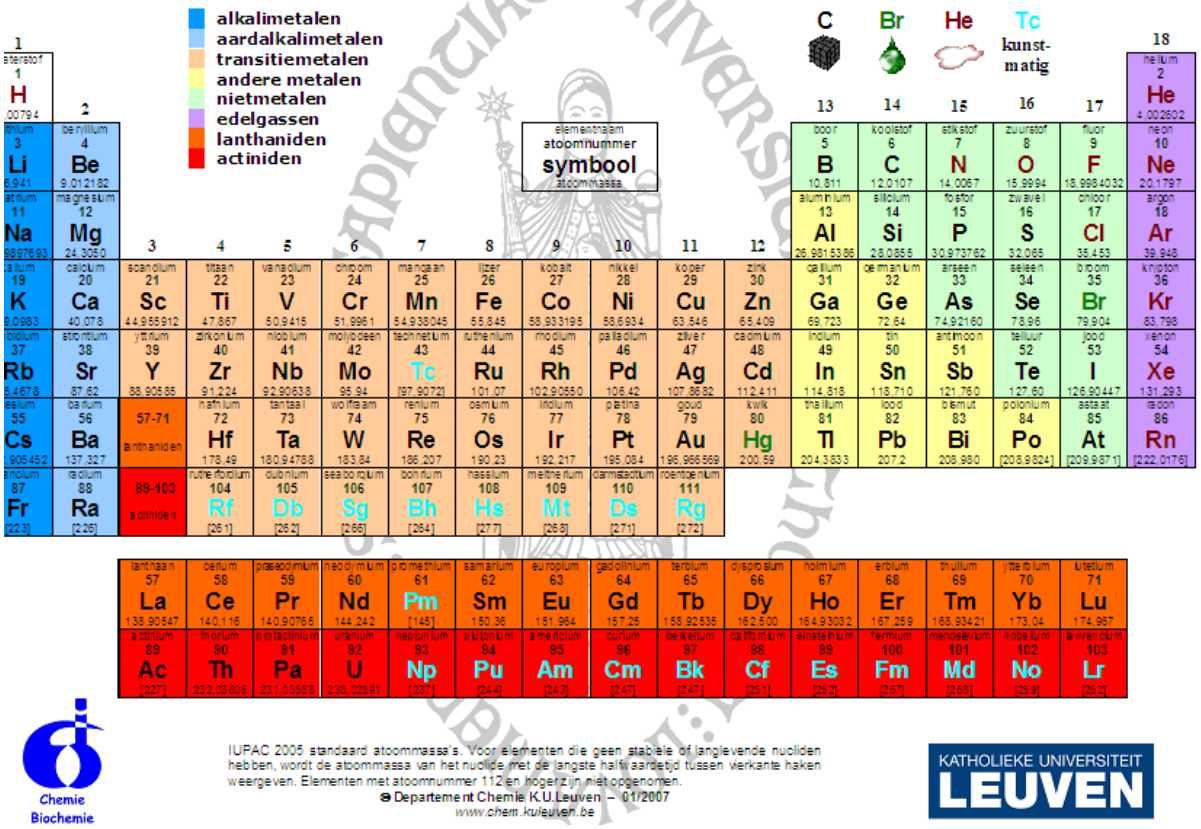
		Physics: In 2006 Norman Dombey[2] concluded that Mills' theory of hydrino states is "unphysical". According to Dombey, the hydrino states would require: * non-relativistic counterparts to remain physical, but they don't have them. * compatibility with a coupling strength (fine structure constant[3]) equal to zero to remain physical, yet "hydrino states" seem to exist in the absence of any coupling strength. * binding strength that falls with the coupling strength. The hydrino model predicts that binding strength for hydrino states increases as the coupling strength falls, rendering the states unphysical. In 2007 Antonio Di Castro[4] showed that the states below the ground state, as described in Mills' theory, are incompatible with the Schrödinger, Klein-Gordon and Dirac equations.
Q	Why this strange attitude?	Theorists hide behind their theories and ignore the "truth" of the repeatable experiment. It's not because Mills theory is not true that his experiment has no value. To say the least; a strange ignoring attitude is assumed. in other Modules we will see that this fact, unfortunately, is not unique.
E	A strange calculation	In M1 we put the amount of energy that is present in the charge q_e equal to that of m_e. With n = 1 we normally have the lowest binding energy and that is $E_1 = R_y$. Suppose we express in Rydberg units the total amount of energy assumed to be present in the two charges, that of the electron q_e and that of the proton q_p , then $q_e = q_p = m_e$ = 0,511 MeV. The total amount of energy available for the binding of the two charges then is $2m_e$ = 1,022 MeV. This amount of energy is exactly equal to 4 R_y/α^2 with α being the fine structure constant. This link between the assumed energy of the charges and the binding of the electron to the nucleus is a strong indication that the coupling constant finds its origin in the energy that is present in the charges.
E	The expected difference in charge	The transformation of the energy of the charge happens in respect with the ratio of the transformation of mass in energy as in $E = mc^2$ so $E \equiv qc^2$ whereby q is the transformed charge. 1u = atomic mass-unit or u = 931,494 MeV/c^2. m_e = 5,4858 x 10^{-4} u = 0,511 MeV The transformation of H → $H^*_{1/3}$ gives an energy of 108,8 eV. This is 1,168 x 10^{-7} u. That means that 0,0107% of the total charge in the H-atom is transformed into energy. Half of it is coming from the electron and the other half is coming from the proton. The transformation of H → $H^*_{1/4}$ gives an energy of 204 eV. This is 2,19 x 10^{-7} u. That means that 0,0213% of the total charge in the H-atom is transformed into energy. The electron of $H^*_{1/3}$ so loses 0,00535% of its charge. The electron of $H^*_{1/4}$ so loses 0,0107% of its charge.
Q	Why don't we take this experiment	If you do not know the possibility of energy coming from charges than this experiment represents a serious violation of the law of

[2] Professor emeritus of theoretical physics at the University of Sussex
[3] The fine structure constant α is the fundamental constant in physics (coupling constant) which determines the strength of the electromagnetic interaction.
[4] Professor of Physics at the University of Illinois

	seriously in Physics?	conservation of energy. The assertion of Randell Mills with the broken quantum numbers cannot be taken seriously because where stays the concept of quantum if you can take small pieces of it? Also, the mathematical formalism of the wave functions does not last in those circumstances. It is not very hard to imagine that for both reasons one would rather not see such an experiment and dito explanation. So the Model offers a more plausible explanation. It compromises the view of quantum mechanics that charges are inscrutable features.
T	Assertion of the Model: a response that we call an **external reaction** because of the working mechanism.	According to the Model there are two ways for the charge to release energy: * The electron can release energy by emitting a special kind of photons: magneto photons. These photons are faster than normal light: their speed is $\sqrt{2}$ times the speed of light c. * For the electric equilibrium of the atom the up-quarks of the nucleus (proton) also release part of their positive charge. The energy of this charge is transformed into kinetic energy with the formation of plasma as a consequence: $u(+2/3^{e}\ e^{-}) \searrow u(+2/3^{e}\ e^{-}) \searrow d(-1/3^{e}\ e^{-})$ and e^{-} is the elementary charge, the charge of the down-quark (d) remains stable. The proton releases charge by transforming it into movement: part of the drive of the course of space of the charge transforms into kinetic energy.
E		The three effects as observed with the Black Light of Randell Mills: * An aura because the magneto photons go faster than light: $c\sqrt{2}$. This effect is comparable with breaking the sound barrier but then with light. * Delivering of UV by the atoms with which the magneto photons collide (secondary effect). * Formation of plasma (400.000 °C) due to the fact that the charge of the nucleus is transformed into kinetic energy.
E	This process is possible provided a number of **keys** is present that trigger the mechanism!	The experiment of Randell Mills indicates that a method exists that forces a charge to release energy. The **external reaction** can be triggered by a number of keys. In the Modules on HHO (watergas) and fusion we will see that, with other keys, even more types of reactions exist.
T	**1st key**: mono atomic hydrogen (**Ke1**)	Due to the contact from H_2 with the hot coil the molecule will split during a few seconds and mono atomic H emerges. In this condition be the electrical balance of the hydrogen atom may be affected.
T	**2nd key**: contact with potassium (**Ke2**)	Potassium determines the size of the electrical imbalance. Potassium here functions as a catalyst. According to Mills also Strontium has this effect.
E	**Unstable hydrogen atoms**	Hydrogen, that has been affected by the previous two keys, is electrically unstable. The external reaction is triggered by a 3rd key.
T	**3rd key**: contact with tungsten (**Ke3**)	The function of tungsten is probably related to its place in the Periodic Table of elements.
Q + T	What is special at the place in the Periodic Table?	**Left** from **Fe** the transition metals show a predominantly **electrical effect**. I.e. they stimulate the release of energy from the course of space **e'** from the electron. **Right** from **Fe** the transition metals and the non-metals show a predominantly **magnetic effect**, i.e. they can release energy from the courses of space **x'**, **y'**, **z'** in certain circumstances through which the

		mass of the nucleus reduces (for example with fusion).

The Periodic Table of elements



T	**4th key**	The instable hydrogen atom brings elements, on the right of iron (Fe) in de Table, in a condition that makes fusion possible (**Ke4**).
T	Second type of response that we call the **internal reaction** because of the working mechanism. The energy from the reduction of the charge of the electron is not liberated.	The electron of the unstable hydrogen atom gives a small part of its negative charge on to the down-quark (d) of the concerned proton. Thus not only the positive charge of the proton decreases but also the stronger negative charge of the down quark seriously reduces the Coulomb repulsion which means that the repulsion for the other cores reduces: $u(+2/3^{e}\ e^{-})u(+2/3^{e}\ e^{-})d(-1/3^{e}\ e^{-})\nearrow$ and e^{-} is the elementary charge.
Q + T	Cold Fusion or Low Energy Nuclear Reactions (LENR)?	This means that fusion processes must be possible at other conditions or at much lower temperatures than was hitherto considered possible.
T	**5th and 6th key**	The creation of cavities of sufficient high-pressure (**Ke5**) and/or elevated temperature, 3000 to 4000 ° C (**Ke6**), is required to have sufficient energy in order to bring the cores together. At least one of those cores has to have been subjected to the internal reaction. Presence of one of these two keys ensures sufficient (pressure or kinetic) energy to bring the cores with reduced Coulomb repulsion together in order to let them merge.
Ex	Multiple claims!	We will treat these in Module 4.
The above story has a strange outcome for which we need the Periodic Table need again. We are		

talking about semi mono atomic states in watergas or HHO.		
T	$H_2O \rightarrow$ **HHO** $\neq$ **hydrogen + oxygen**	Water can be converted into a gas, **watergas** or **HHO**. We do this by cracking the water rather than to split it. The volume of the water increases by a factor of ~1860. This is done during an incomplete electrolysis at a voltage of 2 Volts at a plate distance of 3 mm.

In the next Modules the following topics will be discussed:
Module 3: HHO (this Module will be divided in a number of sub-Modules)
Module 4: Cold Fusion or LENR
Module 5: The structure of matter
Module 6: The origin and cohesion (also this Module will be divided in a number of sub-Modules).

