ATOMIC STRUCTURE AND FUSION, REVISION OF THERMODYNAMICS, EARTH SIZES AND CREATION OF EARTHQUAKES

ALEKOS CHARALAMBOPOULOS

Abstract: With the methodology we quote, we define the standard weight, which results in the standard mass, to be a derivative quantity. This has implications for all physics, and the quantities we found in atomic physics are somewhat corrected here.

The structure and sizes of a helium atom are described, resulting from the fusion of two hydrogen atoms. Negative mechanical energy is presented here, which is replenished by the thermal energy offered during fusion. Thermal energy is created by the high pressure of hydrogen gas present in the star where fusion takes place and in the interior of the earth, where hydrogen is present at high pressure. During fusion, X-ray radiation is emitted.

The thermal energy supplied to the hydrogen atoms is done according to the equation of the ideal gases, which we modify here, applying our methodology. The specific heat capacity under constant pressure turns out to be equal to that under constant volume.

The atoms of the elements, in the solid and liquid phases, have a large radius, while in the gaseous phase a small radius.

The magnitudes concerning the earth change and the gravity radiation is defined.

The earth has a crust, a fluid mantle and hydrogen inside under great pressure and temperature, where atomic fusion takes place. Here, we review the mass and structure of the earth.

The atomic fusion of hydrogen in the earth's interior produces heat that expands the elements inside it and these press on the tectonic plates of the earth's crust.

Keywords: Atomic Structure, Fusion, Revision, Thermodynamics, Helium Atom, Creation of Earthquakes.

1. INTRODUCTION

We define the standard weight and this means that the standard mass is m=F/g, with the consequences it has, which we develop.

With the atomic theory of the hydrogen atom, which we completed [1] last year, we proceed here to the description and structure of the helium atom, which is the product of the fusion of two hydrogen atoms. Hydrogen is monoatomic and has two bubbles of dilute ether-particles equal in weight and therefore has the weight calculated by physicists for the hydrogen molecule. which, as we said, is one with two equal bodies.

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[1] THE NEW PHYSICS WITH OUT THE CONCEPT OF ELECTRIC CHARGE, Vol. 11 Issue 2October 2023-March 2024

In fusion, a negative mechanical energy arises and this is replenished by thermal energy. This is how we enter the field of thermodynamics, which we correct, with conditions. This negative energy is then replenished by thermal energy caused by the high pressure exerted on the star where fusion occurs, and the pressure results from the gravity of the accumulated hydrogen gas atoms. Fusion also occurs in the interior of the earth, where with corrections we make, there is a dense gas with high pressure, hydrogen.

2. METHODOLOGY

First, we formulate the definition correctly, which is also a prerequisite for the development of the theory. This is how we formulate the definition of standard weight, because when we weigh a matter, we weigh the weight. As a consequence, the mass is a derivative quantity, m=F/g, and not a standard.

In our work, we first develop the principles. Principles are the conditions on which our theory is developed. So, we keep Balmer's empirical formula that explains the spectrum of the hydrogen atom as a principle. This is because here, too, in the atom of the Helium, we retain the quantities that we have found in atomic physics and which arose after we have put Balmer's formula as a principle. In the tube with low pressure and at an electrical voltage of 1000 Volts, where we take the hydrogen spectrum, the temperature is high, the viscosity of the ether decreases and the speed of rotation in the atom returns to the speed of light.

Here, too, we put as principles the power of the experimental formulas, pressure and volume, $P = P_0(1 + a\theta), V = V_0(1 + a\theta)$, to build thermodynamics. Also, as a principle we set the formula of thermal energy, E=mcT.

All work is done by induction and induction, and mathematical induction is particularly rigorous. We emphasize that induction has not been properly applied by established science and we here first make the statutory equation of ideal gases with the principles we set, with induction and then proceed with the same method, to the specific heat capacity of gases.

THE MASS UNIT

When we weigh an object, what we measure is the weight. Thus, the arbitrary standard mass kept in Paris had a weight of 1 Kp. This is the standard weight. But as we have proved[2], the acceleration of gravity on the earth's surface is g=4.9 met/sec2, so the unit of mass is kgr-unit=1kp/g=0.2037 kgr=kgr-unit, (it was assumed that the standard mass is 1 kgr but is derived from the standard weight). Physically[3], it's in Kgr-unit.

THE HYDROGEN ATOM
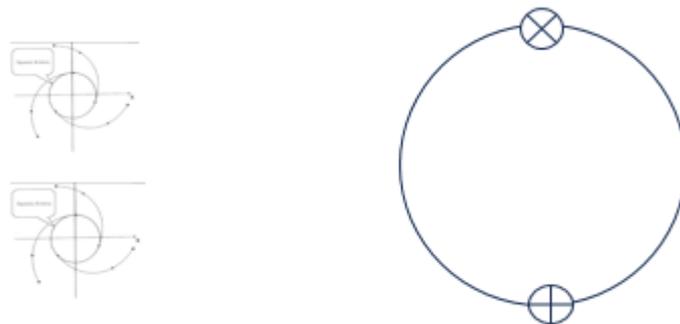
The hydrogen atom. Two bubbles of thin ether of equal mass orbit the center of mass, identical to the left, but because they are facing each other, they have opposite charge, but positive energy. The bubbles have at a very short distance of atomic dimensions, curved dynamic lines of electric charge, then radial.

As we found, the mass of one bubble, when rotating at the speed of light, is $m_P=3.67 \times 10^{-32}$ kgr-unit, and that of the hydrogen atom, which consists of two bubbles, is $m_H=7.34 \times 10^{-32}$ kgr-unit. These bubbles are a bound photon and therefore rotate at the speed of light.

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[2] THE NEW NATURE WITH THE PRINCIPLE OF THE INFINITE PART OF MATTER AND THE NEW APPLIED MATHEMATICS, Vol. 12, Issue October 2024-March 2025

[3] THE NEW PHYSICS WITH OUT THE CONCEPT OF ELECTRIC CHARGE, Vol. 11 Issue 2October 2023-March 2024

The kinetic energy, which is equal to dynamics, is,

$$E_{kin}=E_p = \frac{ke_m^2}{R^2} = \frac{4}{\pi^2} m_p c^2 = 1.32 x 10^{-15} \; E_{kin} - unit$$

Mass and energy are conserved in all cases.

When the pressure inside the tube is small P=8x10^{-4} Atm, for the hydrogen atom in a tube we get its spectrum, the radius of the atom is r=R/2= 7.225x10^{-9} met. Inside the tube the temperature is large, under the flow of electric current. The electric charge is, e=3.03x10^{-16} Cb-unit. The charge and radius of the atom, It depends on the pressure and temperature conditions that hydrogen is present.

The bubble that rotates at the speed of light within the hydrogen atom, at high and low temperatures. Under normal conditions of temperature and pressure, due to an increase in the viscosity of the ether, it decreases from when it was in the tube, we were getting its spectrum and it was at low pressure and ends up at velocity v, but the energy is conserved and that is why the mass increases. Both the rotation frequency and the speed of light are maintained, the radius of rotation is reduced.

Thompson did the following experiment. He radiated from thermionic cathode, charged bubbles, which he considered to be electrons and these passed through a capacitor with an electric voltage V and a magnetic field of two coils B, the distance and length of the capacitor plates are d and l, and the bubbles deviate at angle θ.
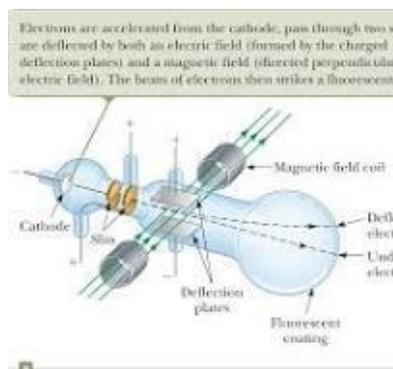
The reason is that Thompson found[4] it is , $\frac{e}{m} = \frac{V\theta}{B^2 ld} = 1.76 x 10^{11}$. But, the electric voltage is V=RI according to Ohm and the unit of current was defined by Faraday and is analogous to the molecular mass gr-mole, i.e. 0.2037 gr-mole, to have it in kgr-unit the molecular mass. Again, the magnetic field was measured by the formula[5] $B = \frac{mg}{18ll}$, where m is the mass of the scales on the current scale and have acceleration g, l is the distance of the two sides of the rectangular current conductor and I is the current flowing through the conductor. Thus, the correction to be made for the mass, is offset with that of the current, in the magnetic field. Then the correction for the acceleration of gravity remains, which we said is half of the acceptable value and the unit of magnetic field hf. So,

$$\frac{e}{m} = \frac{V\theta}{B^2 ld} = \frac{1.76 x 10^{11} x 0.2037}{\frac{1}{2} x \frac{1}{2}} = 1.43 x 10^{11}$$

So, with the electric charge e=3.03x10-16 Cb-unit that we found, and it is, m= 2.3x10^{-27} kgr-unit and, since the energy is conserved and is, the rotation velocity because, $\frac{ke_m^2}{R^2} = \frac{4}{\pi^2} mv^2 = 1.32 x 10^{-15}$, it is v=1.19x10^6 m/sec. We said that the rotation frequency f=3.27x10^{15} Hz is maintained, so it will be, v=ωR=2πf. R=1.19x10^6, and

$$R= 5.79x10^{-11} \; met.$$

This hydrogen beam is in normal conditions.

Hydrogen is monoatomic[6] at 22.4 lit of volume, containing 0.002 kgr, so 0.002x0.2037/22.4 lit=4.07x10^{-4} kgr-unit/22.4 lit, at pressure P$_0$ =1 Atm and temperature 273.215 k.

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[4] MODERN PHYSICS, Serway, p. 96.
[5] PHYSICS II, Halliday-Resnick, p. 176
[6] THE DEATH OF ATOMS AND THE NEW CHEMISTRY IN TERMS OF WORLDVIEW 'THE IDION', Vol. 12, Issue October 2024-March 2025

hydrogen atoms, $N_0 = \frac{4.07x10^{-4}}{2x(2.3x10^{-27})} = \frac{8.85x10^{22}}{22.4lit} = \frac{8.85x10^{22}}{0.0224met^3} = 3.95x10^{24}/met^3$

At pressure $P_Y = 0.0008$ Atm there are fewer molecules, these are N_Y, so,

$$\frac{P_Y}{P_0} = 0.0008 = \frac{\frac{m_Y}{A}\gamma}{\frac{m_0}{A}\gamma} = \frac{N_Y m_H}{N_0 m_H} = \frac{N_Y}{N_0}$$

And $N_Y = 3.16x10^{21}$ molecules/met³. If these molecules were arranged on cube vertices, then the edge of the cube is, $a = (3.16x10^{21})^{-\frac{1}{3}} = 6.8x10^{-8}$ met. So, the radius of the average distance between the atoms, is, $r_Y = \frac{a}{2} = 3.4x10^{-8}$met. We said that at this small pressure and temperature inside the tube where the hydrogen is, the radius of the atom is, $r = \frac{R}{2} = \frac{1.45x10^{-8}}{2} = 7.225x10^{-9}$ met. So, the average distance of the atoms, for the radius of atoms it is, times greater, $\frac{r_Y}{r} = \frac{3.4x10^{-8}}{7.225x10^{-9}} = 4.7$

The average distance between atoms at the pressure of an atmosphere and a temperature of 273.15 k, is,

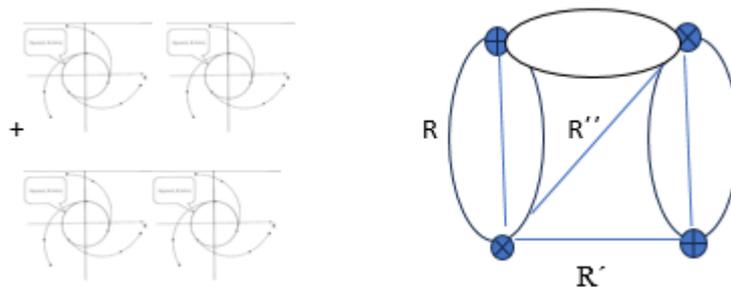$$a = (3.95x10^{24})^{-\left(\frac{1}{3}\right)} = 6.32x10^{-9}met$$

And the average radius of distance between atoms, at this pressure is,

$$r_0 = \frac{1}{2}a = 3.16x10^{-9} \text{ met.}$$

ATOMIC FUSION OF TWO HYDROGEN ATOMS IN ONE HELIUM, AT LOW PRESSURE

At low pressure and increased heat, two hydrogen atoms fuse as follows:

A Helium atom consists of two hydrogen atoms. The bubbles rotate not only in each of the two hydrogen atoms at velocity c, but again at velocity c, the two bubbles of different atoms rotate.

For an atom of the Helium, fusion takes place at a high temperature, where the velocity of rotation is c, and two hydrogen atoms are fused as in the figure above, but there are for each bubble the following energies, while they are, R=R´, R´´=R√2

$$\frac{ke^2}{R^2} + \frac{ke^2}{R'^2} - \frac{ke^2}{R''^2} = \frac{4}{\pi^2}m_p c^2 + \frac{4}{\pi^2}m_p c^2 - \frac{4}{\pi^2}m_p v^2$$

$$\frac{1}{R^2} + \frac{1}{R'^2} - \frac{1}{R''^2} = \frac{4}{\pi^2}\frac{m_p c^2}{ke^2} + \frac{4}{\pi^2}\frac{m_p c^2}{ke^2} - \frac{4}{\pi^2}\frac{m_p v^2}{ke^2}$$

And, so, $\frac{ke^2}{R''^2} = \frac{4}{\pi^2}m_p v^2 v^2 = \frac{\pi^2}{4}\frac{ke^2}{m_p R''^2} = \frac{\pi^2}{4}\frac{3x(3.03x10^{-16})^2}{3.67x10^{-32}x(\sqrt{2}x1.45x10^{-8})^2}$

then v=2.09x10⁸ met/sec.

Initially, the two hydrogen atoms had $E_P = 4\frac{ke^2}{R^2} = 5.24x10^{-15} E_{kin} - unit$

In the atom of the Helium, they have,

$$E_P{}' = 4\frac{ke^2}{R^2} - 2\frac{4}{\pi^2}m_p v^2 = 5.24x10^{-15} - 1.32x10^{-15} = 3.9x10^{-15} E_{kin} - unit$$

There is a loss of energy $\Delta E = -1.32x10^{-15}$, which is compensated by photon emission with an equal amount of positive energy. The energies of the atom are constant (kinetic and dynamic energy), at all pressures and temperatures, and have a

constant rotational velocity c. They keep their mass constant, and in the dynamic energy that is constant, under the various conditions of pressure and temperature, they change with an equal percentage change the amount of electric charge and radius.

The angular momentum is, $\hbar = m_p cR = 1.59x10^{-31}$, $h = 10^{-30}$. Therefore, the photon emitted has a frequency $\Delta E/h=f=1.32x10^{15}$ Hz and a wave $\lambda=227.2$ nm. That is, during atomic fusion, X-photons with a wavelength $\lambda=227.2$ nm are emitted.

THE UNITS OF PHYSICS

It is: The unit of mass, kgr-unit= 0.2037Kgr. The unit of power kp-unit= 0.2037 kp

kp-unit=g. kgr-unit =4.905 kgr-unit

Nt-unit=0.2037 Nt

kp-unit=4.905 Nt-unit

The energy, $E_{kin} - unit = E_p - unit = 0.2037\ Joule$

But[7] the following happens. The established physics and we, accept a minimum electric charge, which by moving produces electricity, is,

I=Ne/t,

I=the electric current, N=the number of elementary minimum charges, e= the minimum charge, and t= the time in which the charge moves. If E is the electric field formed by the electric charges in the conductor, there is a force F=NeE. We know that the potential difference ΔV is $\Delta V/L=E$, i.e. the potential difference at the ends of the conductor of length l, for its distance l, is equal to the electric field E formed by the two charges. Then

$$F = NeE = Ne\frac{\Delta V}{l} = Nma = Nm\frac{\Delta x}{\Delta t^2}$$

m = the elemental mass, the mass of the elemental charge e.

Then, $\Delta V = \frac{m}{e} l \frac{\Delta x}{\Delta t^2} = k\frac{m}{e}v^2$ (1)

k=l/Δx, a coefficient dependent on the resistance of the conductor and we will see below.

But, $I = \frac{Ne}{t} = \frac{Nel}{lt} = \frac{Nev}{l} = \frac{NevA}{lA} = \frac{NevA}{Vol} = nevA$

Where A is the cross-section of the electric conductor of length l, at the ends of which there is the difference in potential ΔV, and lA=Vol, the volume of the conductor, and n=N/Vol, the density of the charges, and we have, $v = \frac{I}{neA}$ (2)

(1), (2) imply,

$$. \Delta V = k\frac{m}{e}\frac{1}{(neA)^2}I^2 = k\frac{m}{e}\frac{1}{n^2e^2A^2}I^2 = k\frac{m}{e}\frac{l^2}{N^2e^2}I^2 = RI^2 = RI_{OHM}$$

$$I = I_{OHM}^{\frac{1}{2}}$$

The current unit, because it was defined in the electrolysis of silver nitrate by Faraday and is proportional to the molecular weight of silver and the unit of mass is equal to 0.2037 Kgr, then, $Amp_{OHM} - unit = 0.2037\ Amp_{OHM}$

$$Amp = Amp_{OHM}^{\frac{1}{2}} = 2.21(Amp_{OHM} - unit)^{\frac{1}{2}}$$

$$Amp - unit = \frac{1}{2.21}Amp = 0.451\ Amp$$

The electric voltage unit is, Volt-unit= 0.2037 Volt

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[7] THE NEW THEORY OF ELECTRICITY AND THE ERRORS OF THE EXISTING ONE, International Journal of Engineering Research and Reviews, Vol. 12, Issue 4 October 2024- December 2024

The energy is,

$$Joule = Volt.Amp_{OHM}.sec = 0.2037^2(Volt - \text{unit}).(Amp_{OHM} - unit).sec = 0.0451\ E_{el} - unit$$

The power of the new electricity, P=VI.sec,

$$Joule = Volt.Amp.sec = Volt.\sqrt{Amp_{OHM}}sec = 0.2037x\sqrt{0.2037}x(Volt - \text{unit}).(Amp - unit).sec = 0.092\ E_{el} - unit$$

$$E_{kin} - unit = E_p - unit = 0.2037 Joule = 0.0092 E_{el} - unit$$

HYDROGEN PRESSURE AND VOLUME

In a cubic meter of hydrogen, at a temperature of zero Celsius, there are atoms, in a cubic meter. Consequently $P_0V_0 = N_0 2mv_0^2$. At another temperature T, and in one cubic meter, it applies, when we have, $\quad N_0 = 3.95x10^{24}$

$$PV = N_0 2mv_T^2$$

If the new formula is at a constant volume of one cubic meter, then,

$$\frac{P}{P_0} = \frac{T}{T_0} = \frac{v_T^2}{v_0^2}$$

Also in a cubic meter of hydrogen, its density is,

$$,\rho_H = \frac{0.08988x0.2037\ kgr-unit}{met^3} = 0.0183\frac{kgr-unit}{met^3}$$

$$\text{And, } v_0 = \sqrt{\gamma\frac{P_0}{\rho_H}}$$

$$P_0 = \frac{N_0 2mv_0^2}{met^3} = \frac{0.0183v_0^2}{met^3} = \frac{\rho_H.met^3}{met^3}\frac{\gamma P_0}{\rho_H} = \gamma P_0 \quad \text{And, } \gamma=1.$$

This formula applies to all gases and air.

The speed of sound at 273.15 degrees Kelvin is, therefore, $v = 331\frac{met}{sec} = \sqrt{\frac{P_0}{\rho_{air}}} = \sqrt{\frac{P_0}{1.3x0.2037}}P_0 = 29,012.8\frac{kp-unit}{met^2} =$

$5,909.07\frac{Nt-unit}{met^2} = 29,012.8\frac{Nt}{met^2}$

This is the pressure of an atmosphere, at 273.15 degrees Kelvin, and it is 0.286 times less than that measured by Torricelli.
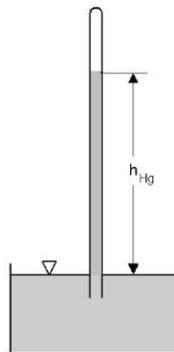
Torricelli experiment, a column of mercury in an inverted tube, located inside a mercury container

He measured the high pressure of the atmosphere. Of course, the mercury in the tube had an acceleration of g, which we gave as the correct value is half. In fact, Torricelli calculated it to be so large that it did not take into account the counterpressure formed in the supposed vacuum formed by the mercury in his tube. It was not a complete vacuum, we cannot achieve a complete vacuum. Mercury atoms were suspended there, which were attracted to each other by both the walls of the tube and the mercury column and formed a counterpressure, which was not calculated. On the other hand, the pressure he calculated is a very great pressure, which man would not bear. Pressure is a bearable pressure for man to accept.
$P_0 = 1.013x10^5 \frac{Nt}{met^2}$, $P_0 = 5.909,07\frac{Nt-unit}{met^2}$

THE EQUATION OF IDEAL GASES AND OTHER CONSTANTS

It is an experimental fact that the volume of a gas, relative to its temperature, is,

$$V = V_0(1 + a\theta) = V_0 a \left(\frac{1}{a} + \theta\right) = V_0 aT$$

Where, the initial volume of the gas, at a temperature of zero Celsius and constant pressure. And $\alpha = 1/273.15$ one constant, 273.15= the temperature of the gas in zero degrees Celsius. This formula was also proven by me, in a relative experiment I did, for a small temperature range.

The pressure of the gas is, where the initial pressure of the gas, at a temperature of zero Celsius and a constant volume. $P = P_0(1 + a\theta) = P_0 aT$

We consider pressure and gas volume formulas, at different temperatures, to be prerequisites for building thermodynamics. The volume is, $V = V_0(1 + a\theta) = V_0 aT$

When both pressure and volume change at the same time, at the same temperature, then they are, T in degrees Kelvin,

$$PV = P_0 V_0 (1 + a\theta)^2 = P_0 V_0 (aT)^2$$

When only the volume changes and the pressure is constant, then,

$$P_0 V = P_0 V_0 aT$$

When the pressure changes and the volume is constant, then,

$$PV_0 = P_0 V_0 aT$$

Established physics, gives for ideal gases the formula,

$$PV = P_0 V_0 aT = RT$$

Find you, who made a mistake and proved this formula for ideal gases.

And, again, $P_0 \Delta V = P_0(V - V_0) = P_0 V_0(aT - 1) = C_P \Delta T = m c_P \Delta T$

$$V_0 \Delta P = P_0(P - P_0) = P_0 V_0(aT - 1) = C_V \Delta T = m c_V \Delta T$$

So, and $C_P = C_V c_P = c_V$

SPEED IN A HYDROGEN ENVIRONMENT

We will have[8], and under constant pressure,

$$P_0 \Delta V = P_0(V - V_0) = P_0 V_0(aT - 1) = N_0 2 m_H v_0^2(aT - 1) = m c_P \Delta T = N_0 2 m_H c_P \Delta T$$

$$P_0 V_0(aT - 1) = 29{,}012.8 \frac{kp - unit}{met^2} V_0(aT - 1) = N_0 2 m_H v_0^2(aT - 1) = N_0 2 m_H c_P \Delta T$$

$$v_0 = \sqrt{\frac{29{,}012.8}{N_0 m_H}} = \sqrt{\frac{29{,}012.8}{0.0183}} = 1263.6 \frac{met}{sec}$$

This is the speed of sound in hydrogen, in a pressurized atmosphere.

then, then, $1263.6 = v_0 = \sqrt{\frac{c_P(\alpha T - 1)}{\Delta T}} = \sqrt{\frac{c_P(T - 273.15)}{273.15.\Delta T}}$, $c_P = 4.36 x 10^5 \, Joule$

It is, $f = \frac{m_H}{h} c_P T = \frac{2.3 x 10^{-27}}{10^{-30}} x 4.36 x 10^5 x 273.15 = 2.73 x 10^{14} Hz$

But this frequency is in the infrared, which is thermal energy.

It will be, $1263.6 = v_0 = \omega r_0 = 2\pi f r_0 = 7.37 x 10^{-13} met$ and $r_0 = \frac{R}{2} = \frac{5.79 x 10^{-11}}{2} = 2.89 x 10^{-11} met$

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[8] The specific heat capacity of hydrogen c_P, calculated experimentally, is c_P=3.41 cal.gr-1.grad-1=3410 cal.kgr-1.grad-1

This beam is the thermal fluctuation-oscillation of the hydrogen beam, which we found to be, under normal pressure and temperature conditions.

The radius of hydrogen under normal pressure and temperature conditions is $r_0 = \frac{R}{2} = \frac{5.79x10^{-11}}{2} = 2.89x10^{-11}met =$, r_0 as mentioned above. And under normal conditions of temperature and pressure and the average radius of distance between the hydrogen atoms, at the same pressure, is, $r = 3.16x10^{-9}$met. This means that gas atoms are very far apart and collide, as described by the kinetic theory of gases.

FUSION TEMPERATURE OF HYDROGEN ATOMS

Above it has been said, that the negative energy in the fusion of two hydrogen atoms, into one helium, is, this energy must be replenished in the helium atom, the heat to which we subject the hydrogen, in order for it to fuse. Under constant pressure, it will happen,

$$E = -1.32x10^{-15}E_{kin} - unit \quad P_0\Delta V = P_0V_0(aT - 1) = E = N_0x1.32x10^{-15}E_{kin} - unit$$

$$T = \frac{N_0x1.32x10^{-15}}{aP_0V_0} + \frac{1}{a} = 4.9x10^7 \, k$$

But we said, so, $\frac{P}{P_0} = \frac{T}{T_0} = \frac{v_T^2}{v_0^2} \frac{P}{P_0} = \frac{v_T^2}{v_0^2} = \frac{T}{T_0} = \frac{4.9x10^7}{273.15} = 1.79x10^5$

We found, therefore, $v_0 = 1263.6, \quad v_T = 5.35x10^5 met/sec$

These are the temperature, pressure, and average thermal velocity of the radial oscillation of the hydrogen atom when fusion occurs.

$$f = \frac{m_H}{h} \, c_P T = \frac{2.3x10^{-27}}{10^{-30}} x4.36x10^5 x4.9x10^7 = 4.91x10^{16}Hz$$

In fact, it will be, $v_T = 5.35x10^5 = \omega r_T = 2\pi f r_T = 2\pi x4.91x10^{16}r_T$

Consequently, this is the radial thermal oscillation in the hydrogen atom, $r_T = 1.73x10^{-12}met$,, at fusion temperature and pressure. It is times greater than the radial thermal oscillation under normal conditions. $\frac{r_T}{r_0} = \frac{1.73x10^{-12}}{7.37x10^{-13}} = 2.34$

HYDROGEN BEAM IN GASEOUS, LIQUID AND SOLID STATE

We have said, that at a temperature of 273.15 k and the pressure of an atmosphere, the radius of the hydrogen atom is, and that the atoms are at a very great distance relative to this radius. It is in a state of gas. At a temperature of 22.02 k, it becomes liquid and at a temperature of 14 k, it becomes solid. When the hydrogen atoms are, then they are at an average distance, met. $r = 2.86x10^{-11}met, \, N_0 = 3.95x10^{24}, \, r = 3.16x10^{-9}$

At low temperatures for hydrogen, because the viscosity of the ether decreases, the velocity of the atom's charges increases, the mass of the bubble particles decreases, and their radius also increases. Then the radius of the atoms becomes comparable to the distance of the atoms, and when they are almost equalized, then the temperature is very low and the hydrogen is in a solid state. At a slightly larger difference in radii and distance, it is liquid. As the temperature rises, the viscosity of the ether increases and the radius of the atoms decreases, their mass increases and they go into a gaseous state.

When the temperature exceeds zero Celsius and rises towards 2000 degrees, then the viscosity of the ether decreases again and their rotation speed and radius increase, and the mass of the atoms decreases. It switches to a liquid state and then to a solid state. Then, at high temperatures and pressures, fusion takes place. In solid and liquid phases, the element atom has a large radius, and when it transitions into a gaseous phase it shrinks. And at high temperatures the radius increases and then it becomes a liquid plasma.

THE EARTH'S AVERAGE MASS DENSITY

When two masses are about stationary, they are attracted by force, . When one mass rotates around the other, then there is a centripetal force and it is, $F = \frac{Gm_1m_2}{r^2}$,

$$F = \frac{4}{\pi^2} \frac{mv^2}{r} = \frac{4}{\pi^2} \frac{m^2v^2r^2}{mr^3} = \frac{k}{r^3} = \frac{G'm_1m}{r^3}$$

In Cavedish's experiment, the two masses were roughly stationary, and the first formula for the force of attraction of the two masses applies.
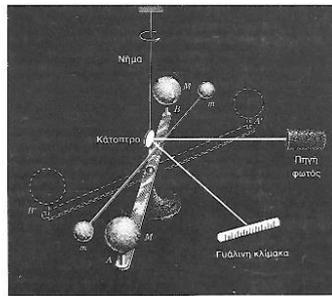
Σχ. 16-4 Ὁ ζυγός τοῦ *Cavendish*, πού χρησιμοποιεῖται γιά τήν πειραματική ἐπιβεβαίωση τοῦ νόμου τῆς παγκόσμιας ἕλξεως τοῦ *Newton*. Οἱ μάζες *m, m* ἀναρτιῶνται ἀπό ἕνα νῆμα. Οἱ μάζες *M, M* μποροῦν νά περιστρέφονται πάνω σ' ἕνα σταθερό στήριγμα. Ἕνα εἴδωλο τοῦ νήματος τῆς λάμπας ἀνακλᾶται στο κάτοπτρο πού εἶναι συνδεμένο στίς *m, m* πάνω στήν κλίμακα καί ἕτσι ὁποιαδήποτε στροφή τῶν *m, m* μπορεῖ νά μετρηθεῖ.

In Cavedish's experiment, two equal masses M were attracted to two equal m, and the latter were even.

In the experiment, there was torque τ, since the yoke oscillated at an angle θ, and the length of the yoke was l and so they had,

$$F\frac{l}{2} = \frac{GMm}{r^2}\frac{l}{2} = \tau\theta, \text{ and } G = \frac{2r^2\tau\theta}{Mml} = 6.67x10^{-11}kgr^{-1}\frac{met^2}{sec^2}$$

But we for the mass derivative, we showed that kgr-unit=0.2037 kgr, so, $.G = 3.27x10^{-10}$

And, so, $F = \frac{GM_{earth}m}{r^2} = mg$

$$M_{earth} = \frac{g}{G}r^2 = \frac{4.905}{3.27x10^{-10}}(6.37x10^6)^2 = 6.08x10^{23} \ kgr - unit = 1.238x10^{23}kgr$$

The volume of the earth is, $V = \frac{4}{3}\pi r^3 = 1.08x10^{21}$, so the average density is,

$$\rho_{earth} = 114.34\frac{kgr}{met^3} = 561.3\frac{kgr-unit}{met^3}$$

Geologists estimate that the earth's crust is about 80 km from the seabed and reaches a maximum height of 120 km on land. We consider the earth to be a sphere, with an average crust depth of 90 km and an average estimated crust density $\rho_b = 2700\frac{kgr}{met^3}$ The volume of the cortex is, $V_b = \frac{4}{3}\pi((6.37x10^6)^3 - (6.37x10^6 - 90000)^3) = 4.52x10^{19}met^3$. Then the mass in this volume is, $m_b = \frac{2700kgr}{met^3}x4.52x10^{19} \ met^3 = 1.22x10^{23}kgr$

So, in the interior of the earth, there is mass,

$$m_{in} = 1.238x10^{23} - 1.22x10^{23} = 1.8x10^{21}kgr = 8.83x10^{21}kgr - unit$$

Inside the crust there is the fluid mantle, with an estimated area of 200,000 met. So further inside, there is a sphere of hydrogen, with a volume,

$$V_{interior} = \frac{4}{3}\pi((6.37x10^6 - 90000)^3 - (6.37x10^6 - 90000 - 200000)^3) = 2.24x10^{20}met^3.$$

The density of hydrogen, in this interior, will be,

$$\rho_H = \frac{2x2.3x10^{-27}}{(1.45x10^{-8})^3} = 0.0015\frac{kgr-unit}{met^3}$$

This sphere has mass, $m_{interior} = \rho_H V_{interior} = 3.37x10^{17}kgr - unit$

Then the mass of the mantle is, $m_m = 8.83x10^{21} - 3.37x10^{17} = 8.829x10^{21}kgr - unit$

The volume of the mantle is,

$$V_m = \frac{4}{3}\pi((6.37x10^6 - 90000)^3 - (6.37x10^6 - 90000 - 200000)^3) = 2.29x10^{19}met^3.$$

And. $\rho_m = \frac{m_m}{V_m} = 385.5 \ kgr - unit = 1892.7 \ kgr$

Therefore, we draw the conclusion that the average crust of the earth is less than 90 km and further inside is the fluid mantle and not as estimated today, but a few tens of kilometers.

The earth was a sun that cooled and acquired a bark and a fluid mantle inside, and inside, a dense gas hydrogen, which in its core there is a fiery flame and its atoms fuse.

GRAVITATIONAL RADIATION

The gravity of the earth assumes that it gives gravitational energy to a mass, so it gives the hydrogen atom energy, $E = \frac{GM_{earth}m}{r} = mgr = 2.23x10^{-27}x4.905x6.37x10^6 = 6.96x10^{-20} \, E_{kin-unit}$

So, it will have a frequency, $= \frac{E}{h} = \frac{6.96x10^{-20}}{10^{-30}} = 69.6 \, GHz$. Hydrogen is the lightest element and this frequency is the lowest gravitational frequency. Gravitational waves are electromagnetic waves, within a frequency range.

EPILOGUE

With the methodology we quote, we define the standard weight, which results in the standard mass, to be a derivative quantity. This has implications for all physics, and the quantities we found in atomic physics are somewhat corrected here.

The structure and sizes of a helium atom are described, resulting from the fusion of two hydrogen atoms. Negative mechanical energy is presented here, which is replenished by the thermal energy offered during fusion. Thermal energy is created by the high pressure of hydrogen gas present in the star where fusion takes place and in the interior of the earth, where hydrogen is present at high pressure. During fusion, X-ray radiation is emitted.

The thermal energy supplied to the hydrogen atoms is done according to the equation of the ideal gases, which we modify here, applying our methodology. The specific heat capacity under constant pressure turns out to be equal to that under constant volume.

The magnitudes concerning the earth change and the gravity radiation is defined.

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