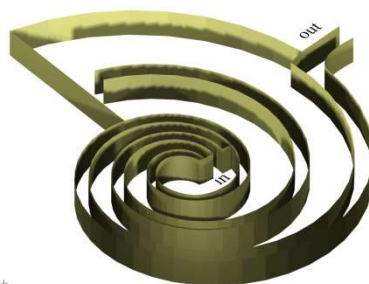


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EX SPIRA AQUA MUNDA
In memory of my son Giovanni

12 October 2019



To my wife **FRANCESCA**

and my daughter **AMANDA**

Synopsis: from A. Avogadro's gas LAW, is deducted an inner description of the nuclei inside the Molecular structures that permits to tie up the Hypothesis of existence of particles [IP] in the Ether/ESF with the description of said inner nuclei.

Paper 1 of 3

Mass of the Neutron through A. Avogadro's Law

Reassessment of the Molecular structure:

Water at density $\rho_W = 1 \frac{Ton}{m^3}$ inside the unit of Volume $[SF]_U = 1[m^3]$ in status of Gas has density:

$$\rho_{W-Gas} = 0,0008944 = \frac{[SF]_U=1[m^3]}{1118} \left[\frac{Ton}{m^3} \right] \text{ at STP}$$

As Gas contains $c^3 = 2.7e^{25}$ molecules of Water H_2O , inside the volume $1[m^3]$

If we fill $1[m^3]$ with 1118 times the mass of Water as Gas we have Water at density $\rho_W = 1 \frac{Ton}{m^3}$ containing inside $1[m^3]$ a number $\frac{N_W}{m^3} = 1118 \cdot c^3 = 3.018e^{28}$ of Molecules of Water per cubic metre at STP, each of mass:

$$1 \frac{dm_{H_2O}}{m^3} = \frac{[SF]_U=1[m^3]}{c^3 1118} = 3.31e^{-29} \left[\frac{Ton}{m^3} \right] \text{ at STP}$$

Nodules n as elementary components of one molecule of H_2O

$$H = 2n \quad O = 32n$$

$$\text{Of mass} \quad dm_n = \frac{dm_{H_2-O}}{40} = \frac{3.31e^{-29}}{40}$$

$$\text{Or} \quad 40 \cdot dm_n = 1 dm_{H_2-O}$$

$$1 \frac{dm_n}{m^3} = \frac{[SF]_U=1[m^3]}{c^3 1118 \cdot 40} = 8.282e^{-31} \left[\frac{Ton}{m^3} \right] \text{ at STP}$$

Basic partition into particles $[IP]$ in the Universe at density $\rho_W = 1 \left[\frac{Ton}{m^3} \right]$ inside a Nodule: $22.36 dm_{[IP]} = 1 dm_n$

$$1 \frac{dm_{IP}}{m^3} = \frac{[SF]_{U=1}[m^3]}{c^3 11118 \cdot 40 \cdot 22.36} = \frac{[SF]_{U=1}[m^3]}{c^3 e^6} =$$

$$= \frac{1}{2.7e^{31}} = 3.703e^{-32} \left[\frac{Ton}{m^3} \right]$$

At STP the unit of volume of Space Fabric is:

$[SF]_U = 1[m^3]$ it contains mass at density $\rho_W = 1 \left[\frac{Ton}{m^3} \right]$

furthermore can be subdivided into a number N_{IP} :

$$\frac{1[Ton]}{[SF]_U} = \frac{c^3 \cdot e^6}{[m^3]} = \frac{N_{IP} = 2.7e^{31}}{[m^3]}$$

In the Universal Reality these IP particles are not residing as

Mass at density $\rho_W = 1 \left[\frac{Ton}{m^3} \right]$ into $[SF]_{W-IP} = \frac{1}{2.7e^{31}} [m^3]$ but

they are in existence inside it at density $\rho_{IP} = c^2 \left[\frac{Ton}{m^2} \right]$

occupying inside it a volume $V_{IP} = \frac{1}{2.7e^{31} \cdot c^2} = 4.11e^{-49} m^3$

leaving the Fabric $[SF]_{IP}$ practically empty.

Note: in this presentation should be accepted that through the measure of mass as $[Ton]$ inside the unit of volume $[SF]_U = 1[m^3]$ as an assembly of fractions of it called Space Fabric we can justify presence of Substance "Water" having density $\rho_W = 1 \left[\frac{Ton}{m^3} \right]$.

Below is shown the necessity to represent the physical reality through a mixture, in Space, of different but equivalent states of existence of substance (Mass) in three states or phases:

$$[IP] \quad [Ton] \quad [kJ]$$

Mass of the Neutron through Avogadro's Law

A tribute to I. Newton and A. Avogadro

Newton as precursor opened the doors to Avogadro's Law but based on what followed both Giants of Science opened the door to the discovery of existence of Ether/ESF as Substance made up of two phases occupying the Euclidean Space, fueling

and sustaining all the physical phenomena which consequently can be explained through the concept introducing a chain (open cycle) of entropic transformations/degradations in the Universal Reality.

Note: This is a paper claiming that the gravitational theory, (Newton's Law) and Avogadro's Gas Law, are the fundamental Laws on which proof of existence of the Ether/ESF is based.

Fundamental Definitions

- 1) The mass of the [IP] particle belonging to the phase [ESF] of Ether/ESF in the Euclidean Space is provisionally presented as having density equal to that of Water

$$\rho_{ESF} = 1 \left[\frac{\text{Ton}}{\text{m}^3} \right] \equiv \rho_W \text{ Inside a Volume of:}$$

$$[SF]_{W-IP} = 3.7e^{-32} [\text{m}^3]$$

In effects:

- 2) is concentrated as "pure basic substance" of density

$$\rho_{IP} = c^2 \left[\frac{\text{Ton}}{\text{m}^3} \right] \text{ On the center of a fraction } [SF]_{W-IP} \text{ of the unit of volume of Space Fabric } [SF]_U = 1[\text{m}^3]:$$

$$[SF]_{W-IP} = \frac{SF_U=1[\text{m}^3]}{c^3 \cdot e^6} = 3.7e^{-32} [\text{m}^3] \text{ as a sort of gas } [ESF]$$

that when under absorption enters the nuclei of the gravitational mass $M(\rho, R)$ made up of single clusters of

$$22.36 \cdot [SF]_{ESF} = 22.36 \frac{1}{c^3 \cdot e^6} [\text{m}^3] = n[IP] \text{ called "nodules"}$$

(all the same mass at STP), the nodules, in turn are clustered together in a fixed number (40 of them) forming the nucleus of a Water molecule.

$$1\text{nodule} = 22.36 \text{ IP}$$

$$2\text{nodules} = 1\text{Proton}$$

$$2\text{nodules} = 1\text{Neutron}$$

$$4\text{nodules} = 1\text{Proton} + 1\text{Neutron} = 1\text{Hydrogen}$$

$$8\text{nodules} = 2 \text{ Hydrogen}$$

32nodules = 1 Oxygen

40nodules = 2 Hydrogen + 1 Oxygen = 1 Water Molecule

` Demonstration of existence of substance (Mass) in the Universal reality present in three separate equivalent conditions Consequences...

Ruggeri's observation

Through Avogadro's Law we can safely assume that at STP the number of Gas molecules inside the unit of volume $[SF]_U = 1[m^3]$ is:

$$\frac{N_{Molec-Gas}}{m^3} = \frac{N_A}{1"mole"} = \frac{N_A}{0.02236[lit]} = \frac{N_A \cdot 44.7213611..}{1[m^3]} \cong$$
$$\cong 2.7e^{25} = (3e^8)^3 = c^3$$

Then, in the Microcosm,

$$c = 3e^8 = 300,000,000 = \sqrt[3]{\frac{N_{Molec-Gas}}{m^3}} \text{ is the analogic}$$

correspondent of c "speed of transmission of light" in the "Macrocosm" and each of these Gas molecules contained in the volume obtained subdividing $1[m^3]$ by c^3 in the "microcosm" are made up of mass in a sort of relation with the mass in status of expansion at speed of light.

The consequence of this assumption is that subdividing the volume:

$[SF]_U = 1[m^3]$ By c^3 we obtain a volume of Space Fabric:

$$[SF]_{Gas} = \frac{1}{c^3} = 3.7037e^{-26}[m^3]$$

That for Avogadro's Law contains at STP one molecule which being in status of Gas only occupies a fraction of it.

In order to proceed we take as reference the Water as Substance "occupying in full" the unit of Euclidean Space at density:

$$\rho_{W-Subst} = 1 \left[\frac{Ton}{m^3} \right].$$

In our case, Water in status of Gas at STP shows a density:

$$\rho_{W-Gas} = 0.0008944 \left[\frac{Ton}{m^3} \right]$$

This means that inside the $[SF]_{Gas} = \frac{1}{c^3} = 3.7037e^{-26} [m^3]$ the volume:

$$[SF]_{W-mol} = \frac{0.0008944}{c^3} = \frac{1}{c^3 \cdot 1118} = 3.3126e^{-29} [m^3]$$

Is "only" occupied by a molecule of Water and to fill the volume $[SF]_{Gas}$ we need to insert in it a number 1118 of molecules of water.

Then if inside the unit of Space Fabric:

$[SF]_U = 1 [m^3]$ Are present at STP a number:

$$\frac{N_{W-Gas}}{m^3} = \frac{c^3}{m^3} = \frac{2.7 \cdot e^{25}}{m^3}$$

Molecules of water in status of Gas to fill the same

$[SF]_U = 1 [m^3]$ of water as Substance at density

$\rho_{W-Substanc} = 1 \left[\frac{Ton}{m^3} \right]$ we need:

$$\frac{N_{W-Molec}}{m^3} = \frac{N_{W-Gas} \cdot 1118}{m^3} = \frac{c^3 \cdot 1118}{m^3} = \frac{3.0186e^{28}}{m^3}$$

Molecules of water,

$$\text{Each of mass } dm_{W-Molec} = \frac{1}{3.0186 \cdot 10^{28}} = 3.3187e^{-29} [Ton]$$

Each contained at density $\rho_{W-Mol} = 1 \left[\frac{Ton}{m^3} \right]$ inside a Space Fabric of volume:

$$[SF]_{W-Molec} = \frac{1}{c^{3 \cdot 11118}} = \frac{1}{3.0186e^{28}} = 3.3127e^{-29} [m^3]$$

For which: $\frac{dm_{W-Molec}}{SF_{W-Mol}} = 1 \left[\frac{Ton}{m^3} \right]$ is containing Water as Substance at density $\rho_{W-Subst} = 1 \left[\frac{Ton}{m^3} \right]$.

Inside each molecule of Water,, the nucleus contains 40 nodules of mass, each at density

$\rho_W = 1 \left[\frac{Ton}{m^3} \right]$, the volume they occupy, by consequence, will be:

$$V_{W-Nodule} = \frac{1}{3.01^{28 \cdot 40}} = 8.28175e^{-31} [m^3]$$

(See above “mass of 1Proton=2Nodules”

Now each of these two “nodules” is not at density $\rho_W = 1 \left[\frac{Ton}{m^3} \right]$

But rather is mass highly concentrated at density:

$$\rho_{IP} = 1 \left[\frac{IP}{m^3} \right] \equiv c^2 \left[\frac{Ton}{m^3} \right]$$

Inside $[SF]_{W-Molec} = 3.31e^{-29}$ containing the molecule of Water, 40 of these “nodules” are clustered at density ρ_{IP} and, will occupy an extremely small portion of the volume $[SF]_{W-Mol}$ leaving the rest of it practically empty:

The volume occupied by one “nodule” at density $\rho_{IP} = 1 \left[\frac{IP}{m^3} \right]$ is:

$$\left\| \frac{V_{W-Nodule}}{c^2} \right\|_{IP} = \frac{8.28175e^{-31}}{c^2} = 9.202e^{-48} [m^3]$$

And 40 of them clustered together a density $\rho_{IP} = 1 \left[\frac{IP}{m^3} \right]$, make up a volume :

$$\left\| \frac{V_{W-Mol}}{c^2} \right\|_{IP} = 40 \cdot \left\| \frac{V_{W-Nodule}}{c^2} \right\|_{IP} = 40 \cdot \frac{8.28175e^{-31}}{c^2} = 3.681e^{-46} [m^3]$$

Fitting without problems inside:

$$[SF]_{W-Molec} = 3.3127e^{-29} [m^3]$$

Which means that there, one can fit a larger cluster of nodules at density ρ_{IP} (as is the case with other larger molecules of Substance of density $\rho_S > (\rho_W = 1)$, (since for Avogadro's Gas Law (extended to Solid matter) : all the molecules are occupying the same volume at STP) and extra nodules will occupy an extremely small portion of the fixed volume $[SF]_{W-Molec}$ leaving the rest of the $[SF]_{W-Molec}$ practically empty:

Using the above justifications in strict adherence with Avogadro's Law the mass of a nodule at virtual density of substance at density $\rho_W = 1 \left[\frac{Ton}{m^3} \right]$ is equal to the volume occupied by it:

Mass of one nodule

$$\boxed{[SF]_{W-Nodule} \rightarrow dm_{Mass-Nod} = 8.28175e^{-31} [Ton]}$$

From the mass of one nodule (see above) we get the mass of 1 Proton:

$$\boxed{1Proton = 2 \cdot dm_{Mass-Nod} = 1.65635e^{-3} [Ton]}$$

Whilst the mass of 1 Proton as measured with high precision on a specialized Laboratory:

$$\boxed{1 Proton = 1.672621e^{-3} [Ton]}$$

The approximate difference between the two measures of mass values is:

$$\frac{1.672621e^{-30} - 1.65635e^{-30}}{1.672621e^{-3}} = 0.00972$$

About 1%

Note: one atom of hydrogen contains 1Proton and 1Neutron that is approximately the mass of 4 nodules.

$$\begin{aligned} 1\text{Hydrogen} &= 4 \cdot dm_{\text{Mass-Nodule}} = \\ &= 4 \cdot 8.28175e^{-3} = 3.3127e^{-3} [\text{Ton}] \end{aligned}$$

Note: the mass of one nodule, above, is the mass of a cluster of 22.36[IP] particles which at water density (c^2 times that in condensed status)

$$\rho_W = 1 \left[\frac{\text{Ton}}{m^3} \right] \text{ Will occupy a } [SF] \text{ of volume}$$

$$[SF]_{W-IP} = \frac{8.28175e^{-31}}{22.36} = 3.7e^{-32} [m^3]$$

But now is also:

$$[SF]_{W-IP} = 3.7e^{-3} = \frac{1}{c^3 \cdot e^6} [m^3]$$

A number fitting the divisions of substance occupying the Unit of volume $[SF]_U = 1[m^3]$ into particles [IP] constituting the molecule of Water as substance of reference at density:

$$\rho_W = 1 \left[\frac{\text{Ton}}{m^3} \right]$$

If now based on the theory affirming presence in the unit of volume of $[Ether/ESF]$ we accept that the Unit of Space Fabric $[SF]_{W-IP}$ is a basic volume occupied by substance at density:

$$\rho_{IP} = 1 \left[\frac{IP}{m^2} \right]$$

We can say that we have reached the point in which we can affirm coexistence of Substance in the Physical Reality with the phase $[ESF]$ of the $[Ether/ESF]$, defining equal size of the $[IP]$ particles in both cases since mass as Substance of density

$\rho_w = 1 \left[\frac{Ton}{m^3} \right]$ at that level of divisions in the ESF :

$$[SF]_{W-IP} = \frac{1}{c^3 \cdot e^6} [m^3]$$

Is in effect containing $[IP]$ particles at density:

$$\rho_{IP} = 1 \left[\frac{IP}{m^2} \right] \equiv c^2 \left[\frac{Ton}{m^3} \right]$$

Inside a volume:

$$V_{IP} = \frac{1}{c^3 \cdot e^6 c^2} = 4.11e^{-49} [m^3]$$

Fitting with the description of a volume of Space Fabric:

$$[SF]_{W-IP} \equiv [SF]_{ESF} = \frac{1}{c^3 \cdot e^6} [m^3]$$

Near empty as main component of the phase [ESF] of the [Ether/ESF] in the Universal Reality constantly occupied in its center by a particle of mass [IP] at density:

$$\rho_{IP} = c^2 \left[\frac{Ton}{m^3} \right]$$

Resulting into an average density $\rho_{ESF} = 1 \left[\frac{Ton}{m^3} \right]$ as phase [ESF] of the [Ether/ESF], which due to the small size of the [IP] particles can be compared to an extremely tenuous Gas occupying the Universal Reality and coexisting with whatever other status of the Substances present in it.

The status of substance [ESF] in the *Ether/ESF* is unalterable since is defined by density

$\rho_{ESF} = 1 \left[\frac{Ton}{m^3} \right]$ but Physical Gravitational mass coexisting with the [Ether/ESF] absorbs (in time) compatible substance from it through the gravitational phenomenon (entropic degradation in time of the [IP] particles of the [ESF] with whom comes into contact) whilst, in simultaneity with the absorption, during the same unit of time the gravitational mass is subjected to internal process connected to absorption and consisting of degradation of a portion of its mass into mass in Status of Heat, (a phenomenon cancelling its gravitational character and subjecting it to radial

absorption (away from the gravitational mass) by the phase E_{ESF} of the Ether/ESF etc...

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