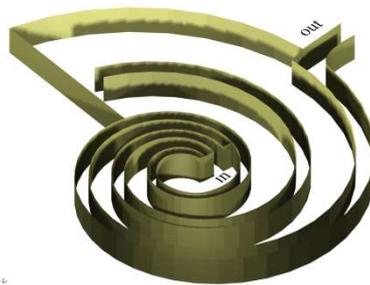


Antonio Ruggeri Dr. Ing.

Roma University (Italy)

[modexp@iafrica.com](mailto:modexp@iafrica.com)



EX SPIRA AQUA MUNDA  
**In memory of my son Giovanni**

8-Jan-19



To my wife FRANCESCA

and my daughter AMANDA

Concepts concerning

MICROCOSMO/

/MACROCOSM

Introduction: a look to the scientific legacy of Amedeo Avogadro' in the field of the Microcosm. His highly Scientific work coupled with magnificent intuition at times when very little was known about the Microcosm, opened the way to great advances in the fields of Physic and Chemistry and in general in the field of Knowledge

### **MICROCOSM- the Gas Law of A. Avogadro's and the Atoms-Molecules as Mini-Black Holes**

The way Avogadro's Law was conceived, concerned gases as an homogeneous ensemble of Molecules made up of simple molecular entities,

Note: a water molecule in status of Gas follows the Laws of Gases.

In these explanations the substance/entity Water, as  $H_2O$  at STP, in status of Gas at density:

$\rho_{W-Ga} = 0.0008944 = \frac{1}{1118} \left[ \frac{Ton}{m^3} \right]$  and as substance/entity in status Liquid-Solid at STP at density  $\rho_{Water-Liquid-Soli} = 1118 \cdot \rho_{W-Gas} = 1 \left[ \frac{Ton}{m^3} \right]$  are fundamental references due to the

particular behaviour of the water in status of Gas and in Liquid-Solid Status.

Whilst other pure Gases can be easily associated to densities close to that of water in gaseous conditions:

$$\rho_{Gas} \ll \rho_{Water-Liquid-Solid}$$

Other substances existing exclusively in solid Status have the physical peculiar character that they are at density:

$$\rho_{Solid} \geq \rho_{Water-Liquid-Solid}$$

Note: this presentation is trying to follow, intuitively, the way A. Avogadro entered the study of gases since at his times little was known about atoms and molecules, is to be noted that he made no difference about the substance (under observation) his only concern was that “it had to be pure”, with the knowledge gained in the “interim” I will refer to Gases as molecules made of couple of atoms  $H_2 - O_2$  and to Water  $H_2O$  as Gas containing 3 Atoms. and the observation that atoms and molecules in solid status are substance contained in a fixed rigid Volume (Space Fabric)

$V_{SF-liquid-so}$  of Euclidean Space but when in Gaseous Status (less dense) they still occupy, in the Euclidean Space, the same volume they were in as solid whilst are free to move inside a much larger Space Fabric ( $V_{SF-Gas}$  ).

It results that the Water molecule as a Gas and as a liquid Solid Substance, inside the unit of Volume, thanks to its peculiar characters was chosen as substance of reference.

The following equation is valid at STP between the Space Fabric occupied by Water as Gas  $V_{SF-Gas}$  (moving in the Euclidean Space) and the Space Fabric occupied by the

Water molecule as Liquid-Solid (leaving no Euclidean Space between each molecule):

$$V_{SF-Gas} = 1118 V_{SF-Liq-Solid}$$

Furthermore since atoms of Generic Pure Solid Substances ( GPSS, those in the Periodic Table in Solid Status) occupy the same Space Fabric  $V_{SF-Liq-Soli} = \frac{V_{SF-Gas}}{1118}$  that the Water Molecule occupies as a Gas and therefore to fill the unit of volume for them as with the water will be necessary 1118 of them.

In this case they will be present inside that volume of Space Fabric at a relative density:

$$\rho_{GPSS} \cdot \rho_W = \rho_{Solid} \left[ \frac{Ton}{m^3} \right]$$

The number of atomic elements inside the unit of Volume (as in the case of Gases) doesn't change under the same conditions at STP which means that A. Avogadro's Law remains valid (mutatis mutandis) also in the case when substance (atoms-molecules) is in Liquid-Solid status at density  $\rho \geq 1$  occupy the whole Euclidean Space inside the unit of volume.(See the Periodic Table). See below at pg. 6

Note: molecules in Gas status just move inside the Space shared in Dual status of existence with the Ether/ESF.

We see now in the case of Water that the sum of all the molecules  $H_2O$  in Gas status inside the unit of volume,  $1[m^3]$  weighs  $0.0008944 = \frac{1}{1118} \left[ \frac{Ton}{m^3} \right]$  and occupies at STP a volume of  $0.0008944[m^3]$  whereas since Water at Liquid-Solid status  $1 \left[ \frac{Ton}{m^3} \right]$  fully occupies the  $1[m^3]$  of Space available we will

need to have a total mass of 1118 molecules of Water per 1[m<sup>3</sup>] in Gas status) to fill the Euclidean Space of 1[m<sup>3</sup>] with 1[Ton] of mass of molecules of Water.

For all pure substances (mass M inside 1[m<sup>3</sup>]) in solid status since they fill the Euclidean Space occupying (at STP) equal volumes with a number of atoms equal to the number of molecules of Water in Liquid-Solid status (A. Avogadro Law is then, valid also for solid Status) what varies is the density of the single atomic substance in respect to the density of the single atomic entity represented by a molecule of Water:

$$\rho_M > \rho_{Water} = 1 \left[ \frac{Ton}{m^3} \right]$$

Avogadro realized that the products:

$$44722 \cdot 0.00002236 \left[ \frac{Ton}{m^3} \right] (nodule) = 1[Ton]$$

$$1118 \cdot 40 \cdot 0.00002236 \left[ \frac{Ton}{m^3} \right] = 1 \left[ \frac{Ton}{m^3} \right]$$

$$\text{And } 44.72 \cdot 0.02236 [m^3] (1[mole]) \cong 1.0 [m^3]$$

Were useful to the study of pure substance in status of Gases and Liquid-Solid status at STP (at Earth surface level, see below).

His LAW says that in a **fixed volume** (a “mole”) containing a Gas in pure homogeneous status, at “STP” if we substitute that Gas with another (also in pure Homogeneous status) we have “no change” of the number of entities of the substituted Gas. (What changes is the density of the Gas in the Volume of the “mole”).

As a matter of fact in the Microcosm if we assume to have a number of single pure entities of mass inside 1[m<sup>3</sup>], to

investigate what happens inside the volume of  $1[m^3]$  we must at first know what happens to the single entities of mass.

Now at STP we have that a fixed number  $N_M$  of these single entities in status of Gas is inside the  $1[m^3]$  each contained inside an equal volume that we call Space Fabric  $V_{SF-}$   $[m^3]$ :

$$N_M \cdot V_{SF-Gas} = 1[m^3]$$

I want to point the fact that above I called Space Fabric  $V_{SF-Ga}$   $[m^3]$  the volume containing a single entity of Gas and according to A. Avogadro' theory regarding substances in status of Gas, since inside a:

$$1["mole"] = 0.02236 [m^3]$$

There is a number of Gas molecules:

$$N_{(A)} = 6.01502289e^{23}$$

The Volume  $V_{SF-Gas}$   $[m^3]$  of Space Fabric related to the single entity of Gas is:  $V_{SF-Gas} = \frac{0.02236[m^3]}{N_{(A)}} =$

$$3.7e^{-26}[m^3]$$

Whilst there is a number  $N_M$  of Gas molecules inside  $1[m^3]$  each occupying a single volume  $V_{SF-Ga} = 3.7e^{-26}[m^3]$ :

$$N_M = \frac{1[m^3]}{V_{SF[m^3]}} = \frac{1}{3.7e^{-26}} = 2.7e^{25}[-]$$

$$\text{But } N_M = 2.7e^{25} = 300,000,000^3 = (3e^8)^3 = c^3$$

We can then conclude that if inside a volume of  $1[m^3]$  at STP there are  $N_M$  molecules of Gas (any Gas) from the

measurement of its density  $\rho_{Gas}$  we can verify its identity and its purity, if we obtain an integer number  $N_{\ddot{n}}$  in the equation:

$$\rho_{Gas} = N_M \cdot (3.7e^{-26} \cdot N_{\ddot{n}}) \rho_{\ddot{n}} = N_{\ddot{n}} \cdot \rho_{\ddot{n}} \left[ \frac{Ton}{m^3} \right]$$

Where  $N_{\ddot{n}}$  is the number of entities called nodules in the Gas, and:

$\rho_{\ddot{n}} = 0.00002236$  is the mass of the single nodule at density:

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

Which means that takes 44722 of them to get:

$$44722 \cdot 0.00002236 = 1 \left[ \frac{Ton}{m^3} \right]$$

This makes the density of the Water a reference for the single Gas entity contained inside the volume of Space Fabric  $V_{SF}$ :

$$1118 \cdot 40 \cdot 0.00002236 \left[ \frac{Ton}{m^3} \right] = 1 \left[ \frac{Ton}{m^3} \right]$$

$$H_2; N_{\ddot{n}} = 4 \cdot 2 = 8 \quad \rho_{H_2} = 8 \cdot 0.00002236 = 0.00017888 \left[ \frac{Ton}{m^3} \right]$$

$$O_2; N_{\ddot{n}} = 32 \cdot 2 = 64 \quad \rho_{O_2} = 64 \cdot 0.00002236 = 0.001431 \left[ \frac{Ton}{m^3} \right]$$

$$H_2O; N_{\ddot{n}} = 8 + 32 = 40$$

$$\rho_{H_2O} = 40 \cdot 0.00002236 = 0.0008944 \left[ \frac{Ton}{m^3} \right]$$

if we split the  $1[m^3]$  into cubes of volume:

$$V_{SF-Gas} = \frac{1}{c^3} = \frac{1}{(3e^8)^3} = 3.7e^{-26} [m^3]$$

Each of them will contain 1118 molecules  $H_2O$  made up of a number of nodules  $N_{\ddot{n}} = 40$  , of mass  $\ddot{n} = 0.00002236$  whose density is  $\rho = 1 \left[ \frac{Ton}{m^3} \right]$  which at that compaction inside the  $V_{SF-Gas}$  are Water in Liquid-Solid status: occupying the  $V_{SF-Gas}$  as an entity of Gas and takes  $(2.7e^{25} \cdot 1118)$  molecules of Water packed inside the Space Fabric of a Gas to have a density:

$$\rho_W = 1 \left[ \frac{Ton}{m^3} \right] \text{ inside the unit of volume}$$

$$(2.7e^{25} \cdot 1118) \cdot (3.7e^{-26} [m^3]) \cdot (40 \cdot 0.00002236 \left[ \frac{Ton}{m^3} \right]) = 1 [Ton]$$

A molecule of water in status of Gas still maintaining the volume of Space Fabric of a Liquid-Solid ( $\rho_W = 1$ ) due to its condition as Gas, will occupy a volume 1118 times the space that it would occupy at density Liquid-Solid at ( $\rho_W = 1$ ).

The Space Fabric occupied by water as Gas is for (A. Avogadro)

$V_{SF-W-Gas} = \frac{1}{c^3} = 3.7e^{-26} [m^3]$  it contains only one molecule of water.

The Space Fabric occupied by water in Liquid-Solid Status is 1/1118 times smaller than that of water as Gas.

$$V_{SF-W-Liquid-Sol} = \frac{3.7e^{-26}}{1118} = 3.31e^{-29} [m^3]$$

Since all substances as atoms-molecules occupy the same volume of Space Fabric, entities in Solid Status at density

$\rho \geq 1 \left[ \frac{Ton}{m^3} \right]$  do not have reason to exist unless they are containing mass under compression (unless the nodules have a density:

$$\rho \geq 1 \left[ \frac{Ton}{m^3} \right].$$

On this issue the Wisdom ruling the Nature of things allowed this increase of density, since the nodules of mass:

$$dm = 0.00002236 \left[ \frac{Ton}{m^3} \right]$$

Are clustered together at density

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

And since they occupy a space extremely reduced one can have an increase of the density of the substance if increases the number of nodules inside the Space Fabric of the single entity

The above status of concentration of substance is the same at which the particles of mass  $[IP]$  are concentrated in the phase ESF of the Ether/ESF.

This way the Space Fabric of the atomic-molecular entities will result almost empty leaving the possibility to accumulate clusters of nodules corresponding to substances at much

higher density than that of water  $\rho_W = 1 \left[ \frac{Ton}{m^3} \right]$ .

$$\text{Ex: } \rho_{Fe} = 8.74 \left[ \frac{Ton}{m^3} \right] \quad \rho_U = 19.1 \left[ \frac{Ton}{m^3} \right] \text{ etc....}$$

Radius of "all atoms-molecules" at density  $\rho \geq 1 \left[ \frac{Ton}{m^3} \right]$

$$R_{atoms-molecule} = \frac{1}{2} \sqrt[3]{V_{SF-W}} = 160.5 \dots [pm]$$

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Status equations based on A. Avogadro's Law

$$N_M = (3e^8)^3 = c^3 = 2.7e^{25}$$

Is the number of volumes of:

Space Fabric containing substance in status of Gas :

$$V_{SF} = \frac{1}{N_M} = \frac{1}{2.7e^{25}} = 3.7e^{-26} [m^3]$$

I called this volume Space Fabric since we can conceive the  $1[m^3]$  of reference, as part of a structure/building made of rooms all the same size, in this case each of them partially occupied by a single atom-molecule in status of Gas.

When we deal with Gases the turning point is that since is:

$$\rho_{Water-Ga} = 40 \cdot 0.00002236 = 0.0008944 \ll 1 \left[ \frac{Ton}{m^3} \right]$$

For a molecule of water in status of Gas since:

$$\begin{aligned} \rho_{Water-Liquid-So} &= 1118 \cdot 40 \cdot 0.00002236 = \\ &44720 \cdot 0.00002236 = 1 \left[ \frac{Ton}{m^3} \right] \end{aligned}$$

Water in Liquid-Solid status is then requiring 44720 nodules each at density:  $\rho_{\ddot{n}} = 1 \left[ \frac{Ton}{m^3} \right]$  in the unit of volume

But now for  $\rho_S > 1 \left[ \frac{Ton}{m^3} \right]$

$$\text{Is: } \rho_S > 44720 \ddot{n} \left[ \frac{Ton}{m^3} \right]$$

In this case, A. Avogadro's Law still applies as in the case of Water molecule at density  $\rho_W = 1 \left[ \frac{\text{Ton}}{\text{m}^3} \right]$  insofar same atoms-molecules at density  $\rho_S \geq 1 \left[ \frac{\text{Ton}}{\text{m}^3} \right]$  occupy the same volume of Space Fabric

$$\begin{aligned} \text{Ex: } \rho_{Fe} &= 8.74 = 8.74 \cdot (40 \cdot 1118) \ddot{n} = \\ &= 390850 \ddot{n} \left[ \frac{\text{Ton}}{\text{m}^3} \right] \end{aligned}$$

Since 1 atom of Fe occupies the same volume of a molecule of Water:

$$V_{SF} = 3.7e^{-26} \frac{1}{1118} [\text{m}^3] = 3.309e^{-29} [\text{m}^3]$$

It takes 44720 nodules to occupy the unit of volume at density:

$$\rho_W = 44720 \cdot \ddot{n} = 44720 \cdot 0.00002236 = 1 \left[ \frac{\text{Ton}}{\text{m}^3} \right]$$

and there is not possible to squeeze more mass inside the unit of volume unless the density of the nodules changes.

This is made possible in Nature if we observe that the density of mass of the nodules is in units of mass [IP] of density  $\rho_{IP} = c^2 \left[ \frac{\text{Ton}}{\text{m}^3} \right]$

The Fabric of Space  $V_{SF-Liq-Sol} = 3.309e^{-29}$  occupied by atoms of Fe at density  $\rho_{Fe} = 8.74 \left[ \frac{\text{Ton}}{\text{m}^3} \right]$  contains mass:

$$\rho_{Fe} = N_{\ddot{n}} \cdot \ddot{n} = 8.74 \cdot 44720 \cdot \ddot{n} = 8.74 \left[ \frac{\text{Ton}}{\text{m}^3} \right]$$

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

An atom of Fe will contain in units of mass [IP]

$$\rho_{Fe} \frac{V_{SF-Liq-Sol}}{c^2} = 3.21e^{-45} [\text{IP}]$$

Concentrated inside the volume:

$$V_{SF-Liq-Sol} = 3.309e^{-29} [m^3]$$

In conclusion a cluster of nodules belonging to an atom of Fe results to occupy a volume extremely smaller of the

$$V_{SF-Liq-So} :$$

$$\check{V}_{Cl} = V_{SF-Liq-Sol} \frac{8.74}{9e^{16}} =$$

$$= V_{SF-Liq-So} \cdot 9.7111e^{-17}$$

leaving the volume  $V_{SF-Liq-Sol}$  “practically empty”.

### The Connection between A. Avogadro's Law and the gravitational theory, based on the existence of the Ether/ESF.

In the gravitational theory developed by me, the absorption from the Ether/ESF is in concentrated units of mass  $[IP]$  and the equivalence with the units contained inside the unit of volume at STP gives for the units  $[IP]$  a density of:

$$\rho_{IP} \left[ \frac{IP}{m^3} \right] \equiv \rho_{IP} c^2 \left[ \frac{Ton}{m^3} \right] \equiv \rho_{IP} c^4 \left[ \frac{kJ}{m^3} \right]$$

$\rho_{IP}$  is the density of the  $[IP]$  (Indefinable Particles) belonging to the Ether/ESF entering the nuclei of the atomic-molecular entities of the physical mass under entropic degradation, through the gravitational phenomenon of absorption, they are made up of mass at that status of existence  $[IP]$  and they

form naturally clusters of Nodules  $n_i$  which define with their number  $N_{n_i}$  the identity of the substance under observation.

Note: the manner in which the  $[IP]$  particles enter (INPUT) the mass and become part of it and the associated physical phenomena are part of the gravitational theory that I developed.

See: Google-[http://Gsjournal.net/Science-Journals-Papers/Author/117/A., Ruggeri/page/1](http://Gsjournal.net/Science-Journals-Papers/Author/117/A.,Ruggeri/page/1)

This confirms my choice of the adjective Fabric used to define the volumes containing substance, that being at density  $\rho_{IP}$  is very far from filling the Space Fabric  $V_{SF-Liq-So}$ .

I do not think that A. Avogadro realized the potential of his powerful results, on the Status equations (see above) certainly one can obtain through his number  $N_{(A)}$ :

$$N_M = \frac{N_A}{0.02236} = c^3$$

Which is the Number of Gas molecules inside the unit of volume as the cube of the speed of light, but up to present day there is no proof that this truth had been discovered.

And that  $V_{SF-Gas} = 3.7e^{-26} [m^3]$  was ever defined Volume of Space Fabric containing one molecule of Gas at STP.

Note: I can declare priority as far is concerned the concept of Space Fabric which was extended to the study of the Ether/ESF since the Year 2004 when I published:

Google search: **A New Theory in Theoretical Dynamics Based on the Existence of an Ethereal Substance of Given Properties Called Energized Space Fabric**

(Antonio Ruggeri)

These are the equations belonging to Universal Dynamic Science will cause a change in the Scientific Panorama.

A. Avogadro was the precursor of almost everything in modern physics and chemistry, “even” the Atomic Nuclear achievements when one extends his Law of Gases to the solid matter (as mentioned above) have strict connections to his “Gas Law”.

For what I am concerned my attention is centred on the Gravitational phenomena and associated Heat outputs generated in the mass, including additions, comments and conclusions when opportunity arises.

With the discovery (by A. Avogadro) of the “mole” as a constant volume and the “nodule” as a constant quantity of mass at density  $\rho = 1 \left[ \frac{Ton}{m^3} \right]$  used, in his calculations of Gases, as a “constant multiplier” the scientific horizons got enlarged, since with the “mole” was possible to define the Fabric of the Space for substances in status of Gas ( $\rho_{Gas} \ll 1 \left[ \frac{Ton}{m^3} \right]$ ) at a time when “close to nothing” was known about the inner nature of the substances.

Currently, the above equation considering the unit of volume  $1[m^3]$  containing at STP  $c^3$  atomic/molecular entities in status of Gas, shows to be an analogic duality between the Microcosm divided into  $c^3$  units of volume and the Macrocosm (See “Ruggeri Universal formula of dissipation” based on the existence of the Ether/ESF in the Universal Reality, containing an:

“ANALOGIC DUALITY”;

Which is confronting the dual opposition of  $c^3$  entities in status of Gas contained in the unit of volume  $1[m^3]$  at STP in the Microcosm with the cube of the gravitational depression in the unit of volume of  $1[m^3]$  of Ether/ESF over the surface of any Gravitational Mass in the Macrocosm:

$$\bar{\epsilon}(\rho, R)^3 = \left( \frac{v(\rho, R)^2}{c^2} \right)^3$$

Note: this is the first case in which are considered analogies of formulations between Microcosm and Macrocosm and will not be the last.

Note: This topic will be treated more in deep when I will examine the effects of gravity in the microcosm over the single entities.

In the Macrocosm the Heat produced by the  $BH_{Sch-Rugg}$  is an Universal Limit constant in time, it shows that the speed of light  $c$  is in ANALOGIC DUAL CORRESPONDENCE Macrocosm- Microcosm as in the Macrocosm the limit OUTPUT of the  $BH_{Sch-Rugg}$  is:

$$E = \frac{2\pi c^4}{k} = \frac{c^4}{2G} = \frac{c^5}{40} = 6.075e^{40} \left[ \frac{kJ}{1''} \right]$$

But due to the gravitational INPUT of the  $BH_{Sch-Rugg}$  the Heat produced by it (OUTPUT) remains internally (is not dissipated) since from the moment of formation the  $BH_{Sch-Rugg}$  goes indefinitely in expansion.

In contraposition the Volume occupied by the nodules belonging to an entity of Water  $H_2O$  in the Microcosm in units of mass  $[IP]$  (mass compressed at BH status) is:

$$V_{\dot{n}-H_2O} = \frac{40}{c^3 \cdot c^2} = \frac{40}{c^5} = \frac{1}{6.075e^{40}} [m^3]$$

Note: The conditions of existence of the mass (substance) during the continuous gravitational processes of Entropic degradations to which is subjected are centred on three states of existence all of them related through “equivalence”:

$$1 \left[ \frac{IP}{m^3} \right] \equiv c^2 \left[ \frac{Ton}{m^3} \right] \equiv c^4 \left[ \frac{kJ}{m^3} \right]$$

And dissipation of expanded mass in units of  $\left[ \frac{kJ}{m^3} \right]$  from a mass  $M_{LGM}$  which is transmitted at  $c \left[ \frac{m}{1''} \right]$  (the speed of light) through the Ether/ESF constitutes a further phenomenon of entropic degradation.

Note:

The duality:

Water at density:

$$\rho_{Water} = 1 \left[ \frac{Ton}{m^3} \right]$$

In opposition to

$$\rho_{Ethe /ESF} = 1 \left[ \frac{Ton}{m^3} \right]$$

But in effects all the substances in the physical reality (Solids, Gases and Heat included) are also in dual opposition with the Ether/ESF inside the Spaces occupied by them.

see Google : [GSJournal \(Ruggeri a\)](#).

Ruggeri'S Universal Formula of Dissipation  
[essays\\_relativity\\_theory\\_science\\_journal\\_7176](#)

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(English)

