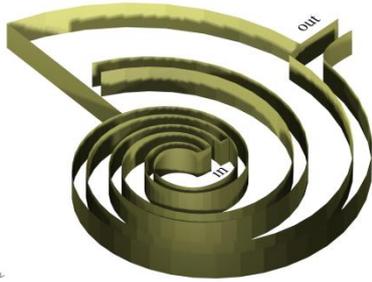
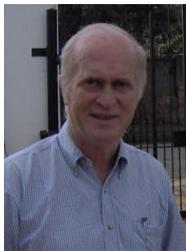


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EX SPIRA AQUA MUNDA  
**In memory of my son Giovanni**  
27-July- 2017



To my wife FRANCESCA  
and my daughter AMANDA  
their love and support  
showed me the way

### Outline

Black Holes have been object of intense discussion but presently in the field of Physics one proceeds only through intuitions, continuous protracted ongoing discussions are the norm, whilst the practical Science proceeds with the usual intuitive techniques founded over “trial and

error” the Theoretical Science is busy putting together explanations which hardly make sense.

How can we reach an explanation justifying the existence of a Black Hole if we cannot justify the phenomena taking place over its surface? Presently there is consensus over the existence of Black Holes but the conclusions do not proceed far that light is captured gravitationally and orbits over their surfaces, one is told as well that nothing escapes from a B.H. and that it disappears from the physical Universe and so on...

Common-sense always told me to be “cautious” since in view of the Law of conservation if a mass dissipates mass in expanded status (as light, gravitational waves etc...) without presence of an inexhaustible source which replenishes the loss, the Universe should show aging and signs of extinction (which seems not to be the case).

My explanation, based on the hypothesis of existence of a substance, the Ether/ESF and on the fact that a physical mass, as we perceive it, absorbs a part of it, in time, through the gravitational phenomenon and transforms it into an addition to its own mass whilst simultaneously through phenomena which are, one way or another, associated to gravity a portion of mass, is dissolved in the Space-Time.

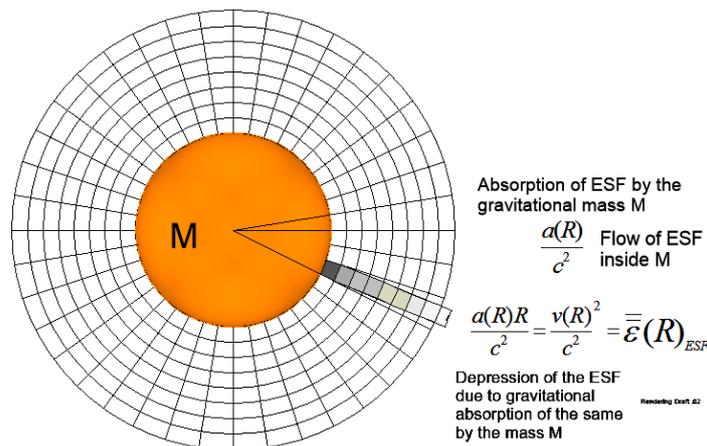
The fashion in which all this takes place will always elude our complete interpretations and for now we have to be satisfied if we manage to do a small advance.

All these phenomena being of physical nature are undergoing natural limits, which are those treated in this Paper.

## **Paper 2**

**Universal Limits, in the Universal Dynamic Science (UDS) supporting existence of the Ether/ESF in the Universal Reality.**

- 1) **Determination of the Universal Limit of dissipation to which a mass respecting the Schwarzschild condition is always subjected**
- 2) **A step forward in the comprehension of the natural phenomena (through combination of the Schwarzschild condition regarding the existence of a **Black Hole**, in association with the Ruggeri condition) permits the determination of a limit Mass self-supporting in the status of **Black Hole** as  $M_{\text{Sch-Rug}}$ .**
- 3) **Determination of a set of special gravitational masses respecting the Ruggeri condition.**



Note: Schwarzschild radius  $r_{\text{Sch}}=R_{\text{BH}}$  and density  $\rho_{\text{Sch}}=\rho_{\text{BH}}$  (BH is for Black Hole, and here for simplicity we will refer most of the time to:

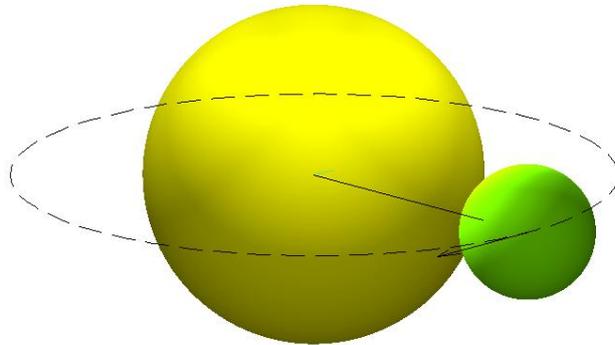
$$M_{\text{Sch}}(r_{\text{Sch}}, \rho_{\text{Sch}})=M_{\text{BH}}).$$

Note: here we assume that the light is expanded inertial mass of gravitational characters, is a portion of gravitational mass  $dm$  released by a mass M, which after change of status of existence (transformation-degradation) entered the dimension time at the maximum universal limit speed of  $\bar{c}$  [m/1"] of transfer in space under limit  $\bar{c} = 1/c$  [dm/c] depression (intended as dilution of presence in space over the unit of time) .

Since mass in that limit status is still gravitational it can orbit, at the surface, a mass  $M_{\text{Sch}}$  (Schwarzschild's Mass, which defines a mass under maximum limit gravitational conditions).

These two Universal conditions of the mass, 1) in expanded status as light (gravitational) and 2) as gravitational substance occupying in status of quiet the unit

of volume of space at density  $\rho$  times that of the basic Substance (the Ether/ESF), are investigated in this paper in order to find other Universal natural (physical) limit conditions, connected to them, in respect of the basic principles sustained in the Universal Dynamic Science.



As already shown on the GSJournal.net , ([Ether/ESF, A new look to precession and gravitational dissipation 15 May 2016](#)) pg. 16 the light beam grazing the surface of a gravitational body of very high gravitational pull would be subjected to bending.

The demonstration of what said above is in the fact that for a mass  $M$  assumed to be in Black Hole Status  $M_{BH}=M_{Sch}=M$  , the Schwarzschild radius is obtained under the hypothesis that the mass  $M$  absorbing the IP particles from the surrounding phase ESF of the Ether/ESF is cause of gravitational depression of the phase ESF associated to expansion of the IP particles which at the surface of radius  $r_{Sch}=R_{BH}$  of the  $M_{Sch}$  reach the maximum allowed value i.e. the IP particles resident in the unit of volume are fully (100%) expanded at  $\bar{\bar{\mathcal{E}}}(r_{Sch})=\bar{\bar{\mathcal{E}}}(R_{BH})=1$ .

This is a physical limit comporting full occupation of the Euclidean Space at the surface of the mass  $M_{Sch}$  by the IP particles resident in the unit of volume and constituting the phase ESF of the Ether/ESF.

Note:  $\rho_{IP} = 1-\epsilon_0 \approx 1$  [Ton/m<sup>3</sup>] as mass present in status of existence of particles in the unit of volume in the Euclidean Space, endowed of the capacity to expand their presence under the depression caused in the unit of volume by the gravitational flow caused by absorption from the central mass  $M_{LGM}$ .

Note: the limit condition, then, for the mass  $M_{LGM}=M_{Sch}$  would be where the gravitational flow is maximum since there the expansion of the IP particles is  $\bar{\bar{\mathcal{E}}}(r_{Sch})=\bar{\bar{\mathcal{E}}}(R_{BH})=1$

What is to be investigated is how the dissipation of the expanded mass would come out radially in the direction opposite to the  $\bar{\mathcal{E}}$  gravitational flow from the surface of the mass  $M_{Sch}$  , at maximum radial transfer speed  $\bar{c}$  under  $\underline{C}$  depression, since at this stage, the space at the surface of radius  $r_{Sch}$  of the mass  $M_{Sch}$  would result totally occupied by the expanded IP particles maintained in that status by the gravitational flow continuously resupplied by the gravitational absorption of the mass  $M_{Sch}$  .

This complete occupation would constitute total blockage of the out coming expanded mass produced inside the Mass  $M_{Sch}$  by internal gravitational degradation.

Impediment of the flow of expanded mass to come out as dissipation from the spherical surface of the mass  $M_{Sch}$  under absorption by the ESF would then mean

compression around the internal surface of the  $M_{Sch}$  followed by explosion/s releasing the local internal compression given as well the fact that (as we will see later on in this paper) any mass in status of  $M_{Sch}$  would at that point be subjected to produce an enormous Universal limit value of transformation into expanded mass cause of internal compression whose natural outcome is dissipation.

In these conditions we have to investigate if in Nature there are conditions in which a mass  $M$ , can reach the limit compression defining the  $M_{Sch}$  and what would be the requirements in order to do so.

Calculations tell us then that is possible that a mass can exist at (reach) that limit (become  $M_{Sch}$ ) but other considerations take place since as it is now, based on what said above, if a relatively small mass reaches that enormous natural limit, getting transformed into expanded mass (it would just generate an explosion producing a ball of fire lasting few fractions of second of time and leaving behind small debris according to the original size of the  $M_{Sch}$ ).

Note: All this when the depressions in the ESF reaches the limit elastic expansion  $\overline{\overline{\mathcal{E}}}(r_{Sch})=1$  of the IP particles (see Paper 1).

Note: these concepts are treated further down in this paper.

## A binary system

Considering a binary system  $M_{SS}$  and  $M_0$  as in the above diagram, if we assume that the central  $M_{SS}$  is very close to be a Black Hole ( $M_{Sch}=M_{BH}$ ) we on Earth would receive straight dissipation from the central  $M_{SS}$  whilst the mass  $M_0$  in orbit at distance  $r_0$  between the centres of  $M_{SS}$  and  $M$  would be close enough to the surface of the  $M_{SS}$  in order to orbit it at transfer velocity  $v(r_0) \sim (30\% \div 40\%) \overline{c}$ .

In a case like this the ( $M_0$ ) over and above the straight dissipation, would release, gravitational waves (GW) of interest to us on Earth.

The amount of expanded mass as Dominant Force of dissipation coming out from  $M_0$  (as Gravitational Waves, GW usually measured as mass transfer in the unit of time in equivalent units of [kJ/1"]) is absorbed by the phase ESF of the Ether/ESF as shown below:

$$(GW) \vec{F}(r_0)_{D-M_0} = M_0 \cdot a(r_0)_{SS} \frac{v(r_0)^2}{c^2} \mathbf{W}^-$$

In the binary system  $M_{SS}-M_0$  under consideration the above value of

dissipation, (shown above), in the unit of time  $F(r_0)_{D-M_0}$  comes out as (GW) from

$M_0$  in orbit of radius  $r_0$  around the  $M_{SS}$  (and can be of a noticeable intensity if the  $M_0$  is very close to the mass  $M_{SS}$ ).

It would reach Earth surface at a distance  $\overline{\overline{Dist}}$  in accordance to the following equation:

$$GW/m^2 f_{D-Earth} \cong \frac{F(r_0)_{D-M_0}}{4\pi \cdot \overline{\overline{Dist}}^2} \left[ \frac{kW}{m^2} \right]$$

Whereas the  $f_{D-Earth} \left[ \frac{kW}{m^2} \right]$  above is a value fluctuating periodically in dependence of the time  $\Delta t_0$  which  $M_0$  takes to orbit the central  $M_{SS}$ .

The dissipation of (GW) reaching us on Earth as a flow of expanded mass or

Dominant Force,  $f_{D-Earth} \left[ \frac{kW}{m^2} \right]$  from the orbiting mass  $M_0$  would also depend

from other parameters entrenched on the flow, for example, the orientation of the plan over which the orbital movement takes place will show a different pattern of periodic variation in time for each binary system under observation.

The UDS is a theory based on the existence of Mass as active substance which is occupying the Euclidean Space in time in three different conditions of existence (Ether/ESF, gravitational-inertial mass and expanded mass) which, time, takes place in it as a special dimension and is describing the physical transformations associated to transfer incurred by a mass in the Euclidean Space. Physical mass in general, is at any time, active substance in the three different conditions of existence mentioned above, undergoing physical phenomena of transformation-degradation, taking place, in time and in Space, from the initial status as the phase ESF of the Ether/ESF, which is absorbed by a mass in gravitational status and through the gravitational process becomes physical mass, then to the gravitational phenomenon of transformation-degradation through which the gravitational mass transforms part of itself, in time, in the status of expanded mass, undergoing inertial transfer in time under absorption by the surrounding phase ESF of the Ether/ESF (dissipating in the space over the time dimension at  $\vec{c}$  speed under  $\underline{C}$  depression).

Due to simultaneous interactions, in time, of these three states of existence with each other a justifiable-explainable, self-contained process can be object of narrative, (see my previous papers on the existence of the Ether/ESF in the Universal reality).

Note: Mass transfer and dissipation in time can also be the result of transformations-degradations of man-made origin unlocking mass into expanded mass.

In order to improve the narrative of physical phenomena, the equation of mass transfer and dissipation in the unit of time, considers the time as a special dimension to be added to the three-dimensional Space, in relation to a  $dm = \rho dV$  of mass which through degradation is expanding-transferring its presence in space during the unit of time at the maximum possible Universal condition and in respect to the equations of reference shown below can under particular conditions, transmit to an ordinary mass, in respect of conservation its capacity to transfer its presence in space:

**Transformation of mass into expanded mass, is the result of a transformation unlocking/releasing in the Space-Time an amount of IP particles of which the physical**

mass is made of, the unlock/release always takes place in opposite direction of two equal quantities  $dm$  (transformation of mass into expanded mass) introducing inertial movement in opposite directions of two equal but separate entities “ $dm$ ”.

The  $dm$  we observe as expanded mass getting transferred in the time continuum as a dimension at the maximum allowed transfer speed  $\vec{c}$  under  $\underline{c}$  depression, in most cases, is only half of the value of transformation (the other half, hidden to our observation but can be found through understanding).

Ex: in case of objects moving in space at inertial speed, the mass from which they were pushed out absorbed the recoil, whilst in the case of dissipation of light from a star the phenomenon is a little more complicated since all the transformation is coming out as dissipation ( $dm/1$ ) from an unit of area of spherical surface is opposed by an equal transformation in the side diametrically opposed of the spherical surface, nevertheless, especially on man-made transformations-degradation, the other half of the phenomenon of release is, as said, in many cases hidden to our understanding.

Let us have a  $dm = \rho \cdot dV$  of inertial/gravitational mass in conditions of quiet, in the three-dimensional Space (it has the Potential to undergo transformation-degradation releasing it into expanded mass).

Let us for the moment overlook the way in which such  $dm$  was released/unlocked and came out of a mass to be transferred in the space along the Time dimension (and observe that the effect of transformation-degradation of the above  $dm$  released by external agent (the gravitational force in this case) is movement/expansion of its presence in Space at maximum linear transfer at speed  $\vec{c}$  inertial constant, under  $\underline{c}$  depression:

The:

$dm = \rho \cdot dV$  During transfer in Space over a time interval  $t=1$ ” whilst occupies a volume  $dV' = dV\vec{c}$  due to movement (transfer) shares with the observer presence of its physical passage diluted  $\underline{c}$  times over the distance  $c$ :

$$\left( \frac{\rho}{\underline{c}} \right) \cdot (dV\vec{c})$$

The equation concerning the above  $dm$  in status of immobility and during transfer in terms of conservation of the mass in absolute is:

$$\rho \cdot dV \equiv \rho' \cdot dV'$$

In the UDS the conditions of existence, of a gravitational mass, in the unit of time as a special physical dimension, are subjected to the equations below:

ABSORPTION=INPUT    DISSIPATION=OUTPUT

A physical mass, through its gravitational capacity to absorb in the unit of time the phase ESF of the Ether/ESF and transform it into a portion of itself, displays to the Observer what has been defined a Dominant Force of Input:

$$F_{D-Input} = \bar{k} \cdot M_{LGM} = \left( dm_{Input} / 1'' \right) \left[ \frac{Ton}{1''} \right]$$

for  $\bar{k} = 8.3775e-7/c^2 [Ton/(m^3 1'')]$ , the Universal constant of absorption of the phase ESF belonging to the Ether/ESF in  $[Ton/1'']$  per unit of mass at density:

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

Whereas the transformation of physical mass  $(dm_{Output} / 1'')$   $[Ton/1'']$  into expanded mass, originated by the gravitational action of the mass  $M_{LGM}$ , can be represented with a Dominant Force of absorption exercised by the phase ESF of the Ether/ESF extracting from the  $M_{LGM}$  the internal production of mass transformed into expanded mass in the unit of time:

$$F_{D-Output} = \bar{k}_{Exp} \cdot M_{LGM} = (dm_{Output} / 1'') \left[ \frac{Ton}{1''} \right]$$

Where  $\bar{k}_{Exp}$  is the amount of inertial mass released/transferred through gravitational action in the  $M_{LGM}$  in the unit of time, in the Space-Time by the unit of mass  $M_{LGM} [Ton]$  contained at density  $\rho_{LGM}$  in the unit of volume occupied by the  $M_{LGM}$ :

$$\rho_{LGM} \left[ \frac{Ton}{m^3} \right]$$

For more info see Paper 1 "the nature of the Ether"

These conditions of existence in a mass in dissipation end up requesting to focus our interest on:

- 1) A mass in which the dissipation is far greater than absorption in which we can make dissipation the only phenomenon of interest, is a mass that (in the Universal Reality) reduces in dissipation its value along the time.
- 2) A mass in which absorption and dissipation have the same values, obviously maintains its stable presence (in the Universal Reality) for an indeterminable period of time.

## At the surface of a mass  $M_{Sch}$  since, as mentioned the IP particles are fully expanded, the internal gravitational transformation (which should come out as Output of expanded mass,  $F_D [kJ/1'']$ ) is impeded to dissipate and there is accumulation of expanded mass causing internal compression which eventually comes out through explosion/s (lacerations of the layer of Expanded IP particles at the surface of the  $M_{Sch}$ ) permitting the expanded mass to be absorbed by the ESF radially away from the  $M_{Sch}$ , as dissipation towards  $\infty$ .

The list of possible phenomena taking place internally to the mass  $M_{Sch}$  at this point is large and depends from variable parameters, it would be even more extended if the mass was close to the limit  $M_{Sch}$ .

In any case I must assert that the gravitational flow of IP particles never would cease to enter the mass since they flow towards the gravitational mass whatever be their expansion.

They are only subjected to the limit gravitational flow associated to the limit expansion (of the IP particles) of value  $\bar{\varepsilon}(r_{Sch})=1$  over the surface of the mass  $M_{Sch}$ . (See graphic below)

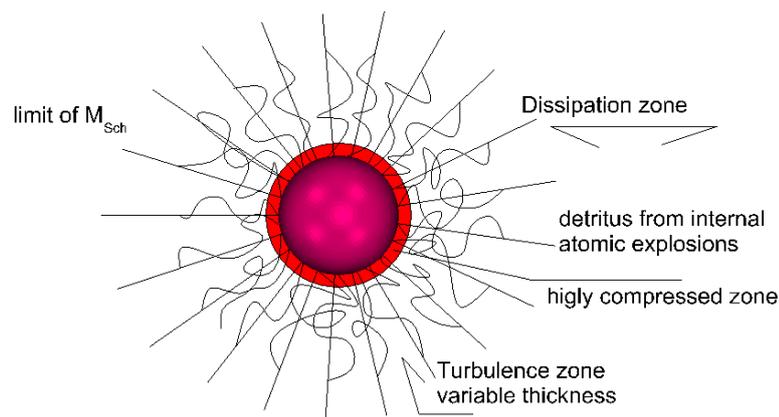
##The ESF is at any time containing mass at the density:

$$\rho_{ESF}=1 \text{ Ton/m}^3]$$

Whereas the condition  $\bar{\varepsilon}=1$  [Ton/m<sup>3</sup>] means 100% expansion of the IP particles in the ESF, it describes the limit condition which takes place at the surface of the mass  $M_{Sch}(r_{Sch}, \rho_{Sch})= M_{BH}$  having radius  $r_{Sch}$  and the average density  $\rho_{Sch}$ .

Actually when and if the limit is physically reached there is nothing to stop the gravitational flow of expanded IP particles to come in even if mass dissipation due to internal transformation of mass into expanded mass is stopped, a fact which will build up a compression, increasing it in time, inside the sphere of radius  $r_{Sch}$ , whilst dissipation would find no way to penetrate the sphere surrounding the surface of the central mass.

This will result into build-up of enormous values of internal compression followed by explosion/s releasing through the mechanism of mass transfer at the maximum allowed speed  $\vec{c}$  under  $\underline{c}$  depression, the expanded mass generated inside the  $M_{Sch}$ .



Note: in the UDS the gravitational constant of absorption  $k$  given in units of expanded mass in [Ton], is  $\bar{k} = \frac{k}{c^2} = 9.31e-24 \left[ \frac{\text{Ton}}{m^2 m \cdot 1''} \right]$  and in equivalent units of expanded mass  $k = 8.3775e-7 \left[ \frac{kJ}{m^2 m \cdot 1''} \right]$ .

By definition for a  $M_{Sch}$  the limit depression in the unit of volume of the phase ESF (of density  $\rho = 1 [\text{Ton}/m^3]$  of the Ether/ESF at its surface is:

$$\bar{\bar{\epsilon}}(r_{Sch}) = \frac{v(r_{Sch})^2}{c^2} = \frac{c^2}{c^2} = 1 \quad (100\% \text{ expansion of the IP particles, those flowing}$$

inside the gravitational mass  $M_{Sch}$  and those permanently present in the unit of volume stuck to the phase  $E_{ESF}$  of the Ether/ESF).

The above concepts are described through the following equations:

**Limit expansion of the IP particles** on the unit of volume:

$$v(r_{Sch})^2 = c^2 = \frac{k M_{Sch}}{4\pi \cdot r_{Sch}} = \frac{k \frac{4}{3} \pi \cdot r_{Sch}^3 \cdot \rho_{Sch}}{4\pi \cdot r_{Sch}} = \frac{k}{3} \rho_{Sch} r_{Sch}^2 \left[ \frac{\text{Ton}}{m^3} \right]$$

Of which the following amount represents a limit gravitational flow absorbed by the Mass  $M_{Sch}$  at the same conditions of maximum expansion:

$$a(r_{Sch}) = \frac{c^2}{r_{Sch}} = \frac{k M_{Sch}}{4\pi \cdot r_{Sch}^2} = \frac{k}{3} \rho_{Sch} r_{Sch} \left[ \frac{\text{Ton}}{m^2 m \cdot 1''} \right]$$

The percentage of IP particles flowing at transfer speed  $\vec{a}(r_{Sch})$  under absorption by the  $M_{Sch}$  is:

$$\frac{a(r_{Sch})}{c^2} = \frac{1}{r_{Sch}} = \frac{\bar{\bar{\epsilon}}(r_{Sch})}{r_{Sch}} = \bar{\bar{\epsilon}}(r_{Sch})$$

If now we associate the **limit mass**  $M_{Sch}(r_{Sch}, \rho_{Sch})$  to a mass  $M(R, \rho)$

$$M = M(R, \rho) = M_{Sch}(r_{Sch}, \rho_{Sch}) \quad [\text{Ton}]$$

The equation above, gives a correspondence between the two masses (in terms of conservation) reflected by the two useful equations:

$$R = \frac{kM(R, \rho)}{4\pi \cdot v} \quad \text{and} \quad \rho = \frac{3 \cdot v(R)^2}{k \cdot R^2}$$

$$r_{Sch} = \frac{kM_{Sch}}{4\pi \cdot c^2} \rho_{Sch} = \frac{3 \cdot c^2}{k \cdot r_{Sch}^2}$$

For the characters of an hypothetical Black Hole of mass  $M=M_{Sun}=M_{Sch}=2e27[\text{Ton}]$ , the  $r_{Sch}$  is:  $r_{Sch}=1482 \text{ [n]}$

Substituting this  $r_{Sch}$  in the above equation we get that the density of a  $M_{Sch}=M_{Sun}=2e27[\text{Ton}]$  must be:

$$\rho_{Sch} = \frac{3 \cdot c^2}{k \cdot r_{Sch}^2} = 1.46e17 \left[ \frac{\text{Ton}}{\text{m}^3} \right]$$

Note: the mass  $M=M_{Sun}(R_{Sun},\rho)$  is just a value of reference to a  $M_{Sch}=M_{Sun}[\text{Ton}]$  whose physical characters are  $\rho_{Sch}$  and  $r_{Sch}$  and the only relation between the  $M$  of reference and the  $M_{Sch}$  is that they both have the same amount of substance

(mass)for them is valid the equation  $\frac{4}{3}\pi \cdot r_{Sch}^3 \rho_{Sch} = \frac{4}{3}\pi \cdot R^3 \rho$

In brief we have defined that a mass  $M_{Sch}$  having the same amount of mass of the Sun of Radius  $R_{Sun}=6.96e8\text{m}$  and density  $\rho=1.4 [\text{Ton}/\text{m}^3]$  has a radius

$r_{Sch}=1482 \text{ [n]}$ . We can then observe that this association requires smaller radius and an extremely larger density since in place of the Sun there would be a small sphere of radius:

$r_{Sch}=1482 \text{ [n]}$  Containing all the mass of the Sun, at density:

$$\rho_{Sch} = \frac{3 \cdot c^2}{k \cdot r_{Sch}^2} = 1.46e17 \left[ \frac{\text{Ton}}{\text{m}^3} \right]$$

In conclusion we have that a mass of a star can be associated to a "shadow Mass  $M_{Sch}$ " internal to it

A highly interesting comparison of physical characters is that whilst in a normal star the gravitational own action produces an apparently large release of expanded mass in the unit of time (dissipation as Dominant Force), if we apply the formula of dissipation to a mass  $M_{Sch}(r_{Sch},\rho_{Sch})$  whose existence is defined by the limit conditions above-named, the result will be a fixed limit value of dissipation.

Adapting the general formula of dissipation in the function of  $M_{Sch}(r_{Sch},\rho_{Sch})$  the extreme Dominant Force which we get is:

Note: the transformation-degradation in time which we call dissipation is caused by internal gravitational transformation of mass into expanded mass:

$F(M_{Sch})_D [kJ/l']$  or  $[kW]$  under absorption by the phase ESF of the Ether/ESF is external to the mass:

Extreme Dissipation: in Space-Time at  $\bar{C}$  speed of transfer under  $\underline{C}$  depression

EXTREME

$$F(M_{Sch})_D = \int_0^{r_{Sch}} \frac{k}{3} \rho_{Sch} \cdot r \cdot \frac{k}{3} \cdot \frac{\rho_{Sch} r^2}{c^2} \cdot 4\pi r^2 \rho_{Sch} dr =$$

$$= \frac{1}{2} \cdot \frac{k}{3} \rho_{Sch} \cdot r_{Sch} \cdot \frac{c^2}{c^2} \cdot \frac{4}{3} \pi \cdot r_{Sch}^3 \rho_{Sch} = \frac{1}{2} \cdot \frac{k}{3} \rho_{Sch} \cdot r_{Sch} M_{Sch} \left[ \frac{kJ}{1''} \right]$$

Note: the above equation is based on the existence of the Ether/ESF, and whilst for an ordinary mass  $M_{LGM}$  depends from the expansion  $\bar{\mathcal{E}}(R)$  of the particles IP (over the surface of the  $M_{LGM}$ ) in the case the mass is  $M_{Sch}$  we have that they are at limit expansion  $\bar{\mathcal{E}}(r_{Sch}) = 1$

For an ordinary mass  $M_{LGM}$  (using concepts related to existence of the Ether/ESF):  
Equation 1)

$$F(M_{LGM})_D = \frac{1}{2} \cdot \left( \frac{k}{3} \rho R \right) \cdot \left( \frac{k}{3} \frac{\rho R^2}{c^2} \right) \cdot M_{LGM} = \frac{1}{2} \cdot a(R) \cdot \left( \frac{v(R)^2}{c^2} \right) \cdot M_{LGM} =$$

$$= \frac{1}{2} \cdot a(R) \cdot \bar{\mathcal{E}}(R) \cdot M_{LGM} = k_{Exp} \cdot M_{LGM} \left[ \frac{kJ}{1''} \right]$$

Where the term  $\bar{\mathcal{E}}(R)$  is the percent depression in respect of  $\bar{\mathcal{E}}(r_{Sch}) = 1$  of the phase ESF over the surface of the mass  $M_{LGM}$ .

Results that in limit conditions such are those of the mass  $M_{Sch}$ , the term related to expansion of the IP particles in the unit of volume is  $\bar{\mathcal{E}}(r_{Sch}) = 1$ , a fact that conceals a surprising conclusion, since if we develop the last term of the above Dominant Force of dissipation:  $F(M_{Sch})_D$  we get a limit equation:

Equation 2 for the mass  $M_{Sch}$

$$F(M_{Sch})_D = \frac{1}{2} \frac{k}{3} \rho_{Sch} \cdot r_{Sch} M_{Sch} = \frac{1}{2} \cdot \frac{k}{3} \rho_{Sch} \cdot r_{Sch} \cdot \frac{4}{3} \pi \cdot r_{Sch}^3 \rho_{Sch} =$$

$$= \frac{2\pi}{k} \cdot \left( \frac{k}{3} \rho_{Sch} r_{Sch}^2 \right)^2 = \frac{2 \cdot \pi \cdot c^4}{k} \left[ \frac{kJ}{1''} \right] \text{ or } \left[ W \right]$$

In dissipation, we have a constant limit Dominant Force developed inside the mass  $M_{Sch}$  presented as a transformation-degradation of mass into expanded mass, taking place inside it and which is flowing radially out of it at  $\vec{c}$  maximum speed of inertial transfer under  $\underline{c}$  depression as expanded mass absorbed radially away from the mass  $M_{Sch}$  in the Euclidean Space by the surrounding phase ESF of the Ether/ESF.

For what exposed above the dissipation from a mass  $M_{Sch}$  would come out only through explosion/s as violation of the barrier provided by the fully expanded IP particles at the surface of the mass  $M_{Sch}$ , the dissipation would not come out as light but as detritus of expanded mass mixed to real mass, also absorbed radially from the external phase ESF of the Ether/ESF and this is basically the reason of the name Black-Hole.

The limit Dominant Force in any Black Hole, in units of mass equivalent [kJ/1"] or [kW] is:

$$F(M_{Sch})_D = \frac{2\pi \cdot c^4}{k} = 6.07e40 \left[ \frac{W}{1''} \right]$$

Which in units of expanded mass in [Ton] is:

$$F(M_{Sch})_D = \frac{2\pi \cdot c^2}{k} = \frac{6.07e40}{9e16} = 6.73e23 \left[ \frac{Ton}{1''} \right]$$

Is a truly excessive amount.

Note: as can be noticed in normal calculations of Dominant Force  $F_D$ , the general result is dependent from the value of the gravitational mass  $M_{LGM}$  which is the one determining the field of depression  $\bar{\bar{\mathcal{E}}}(r)$  for  $0 < r < \infty$  which is reaching a maximum  $\bar{\bar{\mathcal{E}}}(R)$  over the surface of radius R of the mass  $M_{LGM}$ .

See above (Equation 1) where the general formula of gravitational dissipation giving (output of expanded mass from a mass  $M_{LGM}$  expressed in units of mass equivalent) was presented in the following manner:

$$\text{Output 1)} \quad F_{D-LGM} = k_{Exp} M_{LGM} \left[ \frac{kJ}{1''} \right]$$

See above (Equation 2) in which the same formula solved for a mass  $M_{Sch}$  (reaches a maximum limit of expansion of the IP particles  $\bar{\bar{\mathcal{E}}}(r_{Sch}) = 1$  over the surface of radius  $r_{Sch}$  of the mass  $M_{Sch}$  to which corresponds an universal maximum limit output of expanded mass as constant value of dissipation valid for any mass in the status  $M_{Sch} = M_{BH}$  :

$$\text{Output 2)} \quad F_{D-Sch} = \left( \frac{k}{2 \cdot 3} \rho_{Sch} r_{Sch} \right) \cdot M_{Sch} = \frac{2\pi \cdot c^4}{k} \left[ \frac{kJ}{1''} \right]$$

$$\text{or } F_{D-Sch} = k_{Exp-Sch} \cdot M_{Sch} = \frac{2\pi \cdot c^4}{k} \left[ \frac{kJ}{1''} \right]$$

The meaning of the above result is that any mass  $M_{Sch}(r_{Sch}, \rho_{Sch})$ , (in limit conditions), dissipates a fixed value  $F_{D-Sch} [kJ / 1'']$ , referred here as Dominant Force, obviously this result needs an assessment since the amount obtained is really excessive.

Ex: provided that the mass during transformation maintains the status of  $M_{Sch}=M_{BH}$ , a mass equal to that of the Sun ( $M_{Sch}=M_{Sun}$ ) would be (through dissipation) extinguished in about 50 minutes.

Note: it must be added that close to perfect conditions of limit the phase ESF of the Ether/ESF surrounding the surface of the mass  $M_{Sch}$ , contains IP particles nearly completely expanded, obstructing the radial absorption by the phase ESF of expanded mass generated gravitationally inside the mass  $M_{Sch}$ .

(As already mentioned) The presence of this limitation of absorption by the external ESF, constitutes a temporary impediment consisting of build-up of compression of expanded mass inside the spherical shield of radius  $r_{Sch}$ , by internal gravitational transformation of gravitational mass into expanded mass, a sphere of radius  $R > r_{Sch}$  inside which would be accumulated compressed substance (in status of Expanded mass) such accumulation would inevitably be followed by explosion/s, in which part of the substance would come out in a status different from dissipation which in normal conditions comes out as light. (Spherical chunks of all sizes made of expanded mass mixed with real mass in various percentages, absorbed/transferred in all radial directions moving at transfer speed close to  $\vec{c}$  outside the spherical shield violated by the explosion).

What said above is increasingly evident when the conditions of the mass approach the limit condition, those of the mass  $M_{Sch}$ , in the conditions suggested at impeded dissipation.

The criticism in the Universal Dynamic Science (UDS) is that this interpretation of existence of a mass  $M_{Sch}$  is incomplete since in the UDS, whilst dissipation/output of expanded mass transferred away from the mass (any gravitational mass) at  $\vec{c}$

speed under  $\underline{C}$  depression, takes place we also have constant gravitational absorption by the mass (any gravitational mass) of the phase ESF of the Ether/ESF (at the surface of the mass  $M(R, \rho)_{LGM}$ , since the IP particles under absorption by the mass  $M(R, \rho)_{LGM}$  are flowing in expanded status at:

$$\frac{a(R)}{c^2} = \frac{k\rho R}{3c^2} \left[ \frac{Ton}{m^2 m 1''} \right]$$

Causing the depression:

$$\frac{a(R) \cdot R}{c^2} = \frac{k\rho R^2}{3c^2} = \frac{v(R)^2}{c^2} \left[ \frac{Ton}{m^3} \right] \rightarrow \bar{\varepsilon}(R)\%$$

In the unit of volume of the Ether/ESF, at the surface R of the mass  $M(R, \rho)_{LGM}$ , to which corresponds the associated percent expansion  $\bar{\bar{\epsilon}}(R)$  % in the unit of volume of the IP particles in the phase ESF of the Ether/ESF.

The above flow penetrates through the spherical layers below the surface of the mass  $M(R, \rho)_{LGM}$ , and is absorbed init as ordinary atomic mass.

In the Universal Dynamic Science the constant of absorption k from the phase ESF of the Ether/ESF by the physical mass  $M_{LGM}$ , describes the Universal constant phenomenon of absorption directly related to the gravitational mass and is given in equivalent units of expanded mass in [kJ/1"].

G the Universal constant proposed by Newton is related to k in the following way:

$$G = k / (4\pi)$$

The interpretation of the gravitational phenomenon is that the gravitational absorption of the phase ESF builds up increase in units of ordinary mass inside any gravitational mass  $M_{LGM}$ , through absorption by the gravitational  $M_{LGM}$  from the surrounding field ESF (containing the IP particles).

The absorption represents presence of an absolute necessary phenomenon, since in the UDS (theory of the Ether/ESF) is the absorption as an unstoppable flow of substance which determines the expansion  $\bar{\bar{\epsilon}}(R)$  of the IP particles in the phase ESF belonging to the Ether/ESF.

By consequence under the hypothesis of existence of a Schwarzschild mass of radius  $r_{Sch}$  since absorption takes place in units of mass in:

$$\left[ \frac{Ton}{m^2 m l''} \right]$$

The flow, of the phase ESF over the surface of the  $M_{Sch}$  reads in the following way:

$$\frac{\vec{a}(r_{Sch})}{c^2} = \frac{k \cdot \rho_{Sch} \cdot r_{Sch}}{3 \cdot c^2} \left[ \frac{Ton}{m^2 m l''} \right]$$

Corresponding to limit maximum flow over the surface of the  $M_{Sch}$  to which is associated the maximum depression in the ESF and maximum expansion of the IP particles constituting it:

$$\bar{\bar{\epsilon}}(r_{Sch}) = 1 \left[ \frac{Ton}{m^3} \right]$$

Note: I refer here to a substance containing  $1 [Ton/m^3]$  of mass always present as such even when a flow of it crosses the unit of volume, since the flow is continuous and the output is continuously replaced by the incoming flow.

$\bar{\bar{\epsilon}}(r_{Sch}) = 1$  means 100% expansion of the IP particles over the surface of the mass  $M_{Sch}$  since the depression in units of Mass is:

$$\frac{\bar{a}(r_{Sch}) \cdot r_{Sch}}{c^2} = \frac{k \cdot \rho_{Sch} \cdot r_{Sch}^2}{3 \cdot c^2} = \frac{c^2}{c^2} = 1 \left[ \frac{Ton}{m^2 m^1} \right]$$

This equation provides always a solution if we fix one of the two physical data, we therefore have two sets of masses  $M_{Sch}$ .

1) for  $R = r_{Sch} [m]$  will be  $\rho_{Sch} = \frac{3c^2}{kr_{Sch}^2} \frac{Ton}{m^3}$

2) for  $\rho = \rho_{Sch} \left[ \frac{Ton}{m^3} \right]$  will be  $r_{Sch} = \sqrt{\frac{3c^2}{k\rho}}$

Ex: to a mass  $M_{Sch}$  having the radius of the Sun  $R = 6.96e8[m] = r_{Sch}$

Will correspond a density  $\rho_{Sch} = 6.646e5 [Ton/m^3]$

And to a mass  $M_{Sch}$  having density of the Sun  $\rho = 1.4 [Ton/m^3] = \rho_{Sch} [Ton/m^3]$

will correspond a radius  $r_{Sch} = 4.79e11 [m]$

The absorption has values dependent from  $M_{Sch}$ , which is function of infinite couple of values determined by the equations 1) and 2) above.

$$kM(r_{Sch}, \rho_{Sch})$$

whilst for any mass  $M(r_{Sch}, \rho_{Sch})$  dissipation is a limit Universal constant value:

$$F_{D-lim} = \frac{2\pi \cdot c^4}{k} [kJ/1'']$$

the condition of huge dissipation,  $\left( \frac{2\pi c^4}{k} [kJ/1''] \right)$  above described is always present in a mass  $M_{Sch}$  no matter what is the gravitational absorption of the phase ESF of the Ether/ESF, for relatively small masses (absorption  $\sim 0$ ) is necessary to have enormous values of density which can be obtained also through external cause for example through application of enormous compressions (during a short time interval) over the atomic masses.

Any mass  $M_{Sch}$  respecting the Schwarzschild condition is by itself the recipe of a huge natural bomb, coming into existence, if and when, the density of a gravitational mass  $M_{LGM}$  is increased through compression obtained through a natural event. (Example: an object falling/merging with a very large one at extremely high transfer velocity, since in the point of impact the density of the mass can reach extreme values of compression which will release/dissipate, as Heat, transformation of

expanded mass of atomic origin together with the Heat related to the degradation of its kinetic Energy).

As already pointed out a 'Black Hole,  $M_{Sch}$ , of mass equal to that of the Sun ( $M_{Sun}=2e27$  [Ton]  $\equiv M_{Sch}$ ), should have a radius reduced to  $r_{Sch}=1482m$  whilst containing mass at an unthinkable density  $\rho_{Sch}=1.46e17$ [Ton/m<sup>3</sup>].

Note: this field of investigation brings the conclusion that in the Universal Reality there are numberless masses in physical conditions close to the Schwarzschild status of existence, whose absorption depending from the value of the mass  $M_{Sch}$  Doesn't matches the dissipation, making each of them interesting object worth of observation.

### VERY IMPORTANT NOTE

Note: in the Universal Dynamic Science the gravitational phenomenon is explained through the natural capacity of the gravitational mass  $M(R,\rho)_{LGM}$  to absorb continuously, in time (in Universal terms) the phase ESF belonging to the Ether/ESF and transforming it (in terms of conservation) into an addition of mass to the status of existence of the  $M(R,\rho)_{LGM}$ :  
Transformation and absorption in units of expanded mass from the phase ESF of the Ether/ESF:

$$F_D = \frac{\Delta M_{LGM}}{1''} = k \frac{M_{LGM}}{1''} \left[ \frac{kJ}{1''} \right]$$

A mass referred as " $M(R,\rho)_{LGM}$ " would generate in this manner the gravitational field, (a field of flow in the ESF which wouldn't proceed the way we are accustomed to think of a flow of substance, since the IP particles belonging to the undisturbed Ether/ESF are connected to the unit of volume through the extremely thin (of extremely small density) but unmovable (rigid) fabric of the phase  $E_{ESF}$  of the Ether/ESF and whilst they flow under the effect of the gravitational absorption by the mass  $M(R,\rho)_{LGM}$ , they are disconnected from the fabric made up by the phase  $E_{ESF}$  replaced continuously whilst in the unit of volume is subjected to the flow caused by absorption is generated depression.

The effect of this depression is local expansion in the unit of volume occupied by the IP particles which are reaching a maximum value of expansion at the surface of the mass  $M_{LGM}(R,\rho)$  where the flow generated by absorption (as described) is:

$$a(R) = \frac{k}{3} \rho R \left[ \frac{Ton}{m^2 m 1''} \right]$$

The reference is that the depression produced by the gravitational flow forces the particles IP to occupy a percentage of the unit of volume which over the surface of the gravitational mass  $M(R,\rho)_{LGM}$  is:

$$\bar{\bar{\varepsilon}}(R) = \frac{k\rho R^2}{3 \cdot c^2} = \frac{a(R)R}{c^2} = \frac{v(R)^2}{c^2}$$

Limit ( $\bar{\bar{\varepsilon}}(r_{Sch}) = 1$ ) (~100% expansion of the IP particles) when in a mass under limit conditions ( $M_{Sch}$ ) in which the depression is at a maximum  $v^2(R_{Sch}) = c^2$ , the absorption is at a maximum limit value of flow:

$$a(r_{Sch}) = \frac{k\rho_{Sch}r_{Sch}}{3} \left[ \frac{kJ}{m^2 m1''} \right]$$

Expansion of the IP particles then reaches a maximum 100% at which they are occupying the entire Space over the surface of the mass  $M_{Sch}$ :

$$\bar{\bar{\varepsilon}}(r_{Sch}) = \frac{k\rho_{Sch}r_{Sch}^2}{3} = \frac{v(r_{Sch}^2)}{c^2} = \frac{c^2}{c^2} = 1$$

The Scientific Establishment presently has conceived “a beginning of things” through existence of substance in enormous status of density which being what is referred “Black Hole” automatically generated a “Big Bang” dispersing all over the pre-existing Universe, fragments which are observed, at present, in the Universal Reality surrounding us. The idea is just sensationalistic and explains “nothing” if one excepts that through the “Big Bang” is pretended to explain that the masses as fragments of this apocalyptic explosion concerning the supposed existence of a “ab initium Black Hole”, are those in existence at present time (in the Universal Reality).

In the UDS the Ether/ESF ([see GSJournal Ruggeri a February 3, 2016: Ether/ESF and the Power of Creation](#)) is containing two phases, the enormously compressed IP particles as phase ESF appended to the phase  $E_{ESF}$  (the Fabric of the Space).

The Ether/ESF of which the Establishment denies the existence is a necessary physical presence and permits the understanding that there is a cycle of existence in time of substance through which is possible to justify any physical phenomenon.

Note: enormous explosions at sudden enormous rates of dissipation have been observed, my explanation in regard of the manner in which they come in existence is that they can be due to merging of two or more gravitational masses  $M_{LGM}$  in which the contact locally taking place at very high speed would compress the substance to such high extent that the mass would start to dissipate “spontaneously” (being transformed suddenly into expanded mass in a status in which would acquire the capacity to be transferred in Space at the maximum allowed speed in time).

The plethora of phenomena of transformation of mass into expanded mass in time is enormous and is object of continuous interest as we reach deeper levels of understanding, an example regards the volcanism on Earth which can be explained

as an atomic process of dissipation due to compression (when high values of density of mass are reached in the point where two continental masses are moving against each other).

**Existence in the Universal Dynamic Science of a Schwarzschildmass defined by the equation below:**

$$1) \frac{k \rho_{Sch} r_{Sch}^2}{3} = c^2$$

**Under the: Ruggeri condition of conservation:**

$$2) I=0$$

**Meaning that absorption of the phase ESF as physical mass/Input=Output/Dissipation of expanded mass**

**In limit transfer status at  $\vec{C}$  speed under  $\underline{C}$  depression.**

If now we assume to have a mass  $M=M_{Rug} \equiv M_{Sch}$  in which the Dominant Force of absorption (dependent from  $k$  equals the Dominant Force of dissipation dependent from the limit  $k_{Exp-Sch}$  (a mass which satisfies both conditions, Ruggeri's condition and Schwarzschild condition):

$$I=0 \left( F_{D-Input} = k \cdot M \right) = \left( F_{D-Output} = k_{Exp-Sch} M_{Sch} \right)$$

And since: for the above equation to be valid must be:

$$k = k_{Exp-Sch}$$

Or: (see above equation **EXTREME**):

$$k = \frac{1}{2} \cdot \frac{k}{3} \rho_{Sch-Rug} \cdot r_{Sch-Rug}$$

Which is satisfied for:

$$RUG) \frac{\rho_{Sch-Rug} \cdot r_{Sch-Rug}}{6} = 1$$

A condition in which for a mass  $M_{Sch-Rug}$  respecting the Schwarzschild condition:  
i.e.

$$SCH) \quad c^2 = \frac{k \cdot M_{Sch}}{4\pi \cdot r_{Sch}} = \frac{k}{3} \rho_{Sch} \cdot r_{Sch}^2$$

And the Ruggeri condition see equation I=O above, gives a unique solution:

$$F_{D-Input} = F_{D-Output}$$

$$F_{D-Input} = k \cdot M_{Sch-Rug} = 6.07e40 \left[ \frac{Ton}{1''} \right]$$

$$F_{D-Output} = \frac{2\pi \cdot c^4}{k} = 6.07e40 \left[ \frac{Ton}{1''} \right]$$

Gives the unique value of a Schwarzschild-Ruggeri Mass ( $M_{Sch-Rug}$ ) which can sustain itself in the **life of the Universe**, since what loses in time through internal transformation into expanded mass, dissipated/absorbed by the surrounding field of ESF, is simultaneously recovered through absorption by the same  $M_{Sch-Rug}$  extracted from the surrounding phase ESF of the Ether/ESF. We then have that under the conditions of the Universal Dynamic Science (UDS):

$$M_{Sch-Rug} = \frac{2\pi \cdot c^4}{k^2} = 7.24e46 \left[ \frac{Ton}{1''} \right]$$

The condition of existence in the UDS of a gravitational phenomenon (of absorption, in time, of the phase ESF of the Ether/ESF by the mass  $M_{LGM}$  and associated gravitational transformation caused by the  $M_{LGM}$  over its own mass into expanded mass, in time, in turn absorbed by the external ESF under the condition (Input = Output) is the condition of existence in time of a mass  $M_{Sch-Rug}$  whose dissipation output is replaced by mass build-up by absorption of the phase ESF of the Ether/ESF, the continuous replacement, through absorption, of the loss in the mass  $M_{Sch}$  is maintaining, this way, continuous presence in time of the  $M_{Sch-Rug}$  in the Universal Reality.

It remains now to define the limit parameters of this particular unique mass such as the radius  $r_{Sch-Rug}$  and the density  $\rho_{Sch-Rug}$  (I use for this purpose the value of dissipation in time at the surface) that since the Schwarzschild condition permits to deduct the  $r_{Sch-Rug}$  (see the above equation **SCH** in which the value of  $M_{Sch-Rug}$  is known):

$$r_{Sch-Rug} = \frac{kM_{Sch-Rug}}{4\pi \cdot c^2} = \frac{F_{D-Output}}{4\pi \cdot c^2} = \frac{6.07e40}{4\pi \cdot c^2} = 5.367e22 \text{ [m]}$$

Using, the **RUG** equation/condition above, we deduct the density of the unique mass  $M_{Sch-Rug}$  satisfying both conditions:

$$\rho_{Sch-Rug} = \frac{6}{r_{Sch-Rug}} = 1.118e-22 \left[ \frac{Ton}{m^3} \right]$$

The dissipation at the surface of this special mass  $M_{Sch-Rug}$  since kJ are units of expanded mass ( 1[Ton] =  $c^2$  [kJ] ) will be;

**DISSIPATION** of expanded mass from  $M_{Sch-Rug}$

$$\frac{F_{D-Sch-Rug}}{4\pi \cdot r_{Sch-Rug}^2} = 1.676e-6 \left[ \frac{kJ}{m^2 \cdot 1''} \right]$$

Expanded at  $\vec{c}$  inertial constant speed of transfer in the Space-Time under  $\underline{c}$  depression.

Thereafter the gravitational flow of absorption at its surface is:

$$\frac{a(r_{Sch-Rug})}{c^2} = \frac{k}{3c^2} \rho_{Sch-Rug} \cdot r_{Sch-Rug} = \frac{k}{3c^2} \cdot 6 = \frac{2k}{c^2} = \frac{1.676e-6}{c^2} \left[ \frac{Ton}{m^2 \cdot m \cdot 1''} \right]$$

To which corresponds a dissipation in equivalent units of expanded mass in [kJ/ $m^2 \cdot 1''$ ]:

$$2k = 1.676e-6 \left[ \frac{kJ}{m^2 \cdot 1''} \right] \text{ or } \left[ \frac{kW}{m^2} \right]$$

Note: such a small value of dissipation out of the unique possible mass satisfying closely the conditions  $I=0$  (Sch-Rug) will show to an Observer far away a large dark patch whose Universal dimensions, in the heaven, depend purely from the distance, and also in this case the dissipation doesn't comes out as light since depends from violation of the barrier made up by maximum expansion of the IP particles on the surface of the  $M_{Sch-Rug}$ .

This conclusion will give a new meaning to the interpretation of the object as a Black Hole as a limit.

Note: it is not to be excluded the possibility of existence of gravitational entities having parameters close to the  $M_{Sch-Rug}$ .

A possible scenario would be that these gravitational entities ( $M_{Sch-Rug}$ ) could fit the definition of a particular type of Galaxy a fact which would define a Galaxy as a special status of an extremely large gravitational mass....

## The Ruggeri condition $I=O$ in a gravitational mass

The condition of existence Input=Output (in the Space-time) which in the above case helped to define a unique condition of existence for a Schwarzschild-Ruggeri mass, as a limit of existence, must be interpreted as a general condition in the theory assuming the existence of the Ether/ESF from which the Input and Output Dominant Forces were deducted.

I point out now that the Ruggeri condition on its own is defining a class of masses (those respecting it):

See the formula above **Equation 1**

In Equation 1 from the basic condition  $k=k_{Exp}$  extended to any mass is:

$$k = \frac{1}{2} \cdot \left( \frac{k}{3} \rho R \right) \cdot \left( \frac{k}{3} \frac{\rho R^2}{c^2} \right) = k_{Exp} \cdot \left[ \frac{kJ}{m^2 m \cdot 1''} \right] \quad I=O$$

In the above equation, once fixed the density  $\rho$  we obtain the unique value of the Radius  $R=R(\rho)$  an Universal function of the variable  $\rho$  establishing the value of a unique mass  $M(R(\rho))$  which having the radius determined by the density  $\rho$ , in respect of the Ruggeri condition ( $I=O$  or coincidence of the two Dominant Forces) is only dependent from the value of the (known) density  $\rho$ , I renamed both the radius and the mass :

### **$R_{Rug}$ (Ruggeri's Radius)**

$$R_{Rug} \rho = \sqrt[3]{\frac{18 \cdot c^2}{k \rho}}$$

Ruggeri Radius  $R_{Rug}(\rho)$  is the radius of a mass  $M$  of density  $\rho$  (known) at which

Input of substance absorbed from the Ether/ESF and Output from it as dissipation, have the same physical value(in terms of equivalence).

(Note: the comparison is in terms of equivalence between Dominant Forces in [kJ/1''] but we must be aware that absorption of ESF, by a mass  $M$ , takesplace in [Ton/1'']

which although here was usually referred in units of mass equivalent [kJ/1"]or [kW] also takes place in units of mass [Ton/1"]and dissipation of expanded mass is a phenomenon of mass transfer at the maximum allowed speed  $\vec{c}$  under  $\underline{c}$  depression in the Space-Time.

The use of units of mass equivalent is usually preferred, since these units are easier to use as reference, nevertheless whatever units were chosen the conditions of "conservation" in the presentation of the Dominant forces was always respected.

Appendix: Since in the above equation the condition  $I=O$  for (INPUT=OUTPUT) the term fixed in advance for an ordinary Mass  $M$ , is the density  $\rho$ , I have that the Ruggeri's Radius  $R_{Rug}(\rho)$ [m] depends only from the density  $\rho$ , as independent variable, and from inalterable values and so is the Ruggeri mass  $M_{Rug}(R_{Rug}(\rho))$ [Ton], what determines the unit of mass absorbed or dissipated in time is the way the constant of absorption  $k$  or  $k_{Exp}$  is expressed which determines the unit of measure of the Dominant Forces measuring the transfer in the space-time of the substance (since the density  $\rho$  is a pure number dependent from presence of the phase ESF of the Ether/ESF ( $\rho_{ESF}=1$ [Ton/m<sup>3</sup>]), and so is the mass independently from the choice of the units of mass used to refer to the transfer in the Space-Time. The units of measure used to define the constants of absorption in the unit of time are those which determine the unit of measure of the transformation-degradation.

Note:  $M_{Rug}(R_{Rug}(\rho))$  has a value which can be obtained in function of  $\rho$  alone, therefore both  $R_{Rug}$  and consequently  $M_{Rug}$  are defining a unique set of entities  $M_{Rug}$  in which the Ruggeri condition  $I=O$  is respected.

The above equation giving the  $R_{Rug}$ , when applied to a star whose internal density is equal to that of the Sun:

$$\rho_{Sun} = 1.41 \text{ [Ton/m}^3\text{]}$$

Gives a radius:  $R_{Rug}$

$$R_{Rug} = 9.95e7 \text{ [m]} \text{ Ruggeri Radius for } \rho_{Sun}$$

Which now is the value of the radius of the Mass function of density  $\rho=\rho_{Sun}$  which I called generally  $M_{Rug} = M(R(\rho))$ [Ton], outputting an amount of expanded mass in dissipation in [Ton/1"] or in [kJ/1"] or [kW] according to the choice of the constant of absorption and is equal to the input (absorption of the phase ESF of the Ether/ESF).

$$M(R(\rho)) = \frac{4}{3} \pi \cdot R_{Rug}^3 \cdot \rho = \frac{4}{3} \pi \frac{18 \cdot c^2}{k \cdot \rho^2} \rho = 24 \cdot \frac{\pi \cdot c^2}{k \cdot \rho}$$

Then in short:

$$M(R_{Rug}(\rho)) = 24 \frac{\pi \cdot c^2}{k \cdot \rho} \text{ [Ton]}$$

Note: if we insert the density  $\rho_{Sch}=1.118e-22[\text{Ton}/\text{m}^3]$  in the above equation we can see that the mass  $M_{Sch-Rug}$  is the one and only mass which can exist with the true characters of Black Hole as can be checked from the value obtained above, nevertheless the  $M_{Rug}$  here, is reflecting the existence of a set of masses which are function only of the density  $\rho$  and which in virtue of the Ruggeri condition have a special characteristic allowing them a prolonged presence in the Space along the time.

Since  $M(R_{Rug}(\rho))$  is only function of the density  $\rho$  for  $\rho=\rho_{Sun}=1.4 [\text{Ton}/\text{m}^3]$ , the  $R_{Rug}(\rho)$  also only function of  $\rho$  is a nested function in it:

$$M\{R_{Rug}(\rho_{Sun})\} = 5.78e24 \text{ [Ton]}$$

To which corresponds a Dominant Force of input equal to that of output:

$$F_{D-I/O} = kM(R_{Rug}(\rho_{Sun})) = 4.84e18 \text{ [kJ/1" ] or [kW]}$$

It is to be noted that both  $R_{Rug}$  and  $M(R_{Rug}(\rho))$  are physical characters of a mass which only depend from density  $\rho$  (and from fixed physical constants  $k$  and  $c$ ).

The mass  $M(R_{Rug}(\rho))=5.78 e24 [\text{Ton}]$  of radius  $R_{Rug}$  and density  $\rho_{Sun}=1.41[\text{Ton}/\text{m}^3]$  (the same as the Sun) has a value far lower than the mass of the Sun

$(M_{Sun}=2e27[\text{Ton}])$  and whilst the mass  $M(R_{Rug}(\rho))$  of density  $\rho_{Sun}=1.41[\text{Ton}/\text{m}^3]$  absorption of ESF in equivalent units of  $[\text{kJ/1"}]$  and dissipation of expanded mass also in in units of  $[\text{kJ/1"}]$  are equal, for the Sun, as it is at present time, the output in dissipation is far larger than the input of the phase ESF (of the Ether/ESF). See table below:

