The First Bangs

A distributed model of the Universe's genesis

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1. Introduction

There are lots of very accurate data about our Universe and its internal structure that have accumulated mostly from the observations of the last years. The measurements carried out by astrophysicists now generate, in my opinion, many results that are in contradiction with the current model (Big Bang) of the universe's formation. It also comes very clear that my previous model [2] - a Big Bang generated by a supermassive black hole in an already formed universe - is no longer compatible with the current measurements. We have now a pretty good idea about the total quantity of matter existing in the observable universe (stars, cosmic gas clouds and dust, galaxies, not taking into account the black holes), and this value exceeds by several orders of magnitude the mass of the largest black holes discovered until now (around 20 billion solar masses). As a result, a new model of the universe's genesis is needed today; it should be compatible with the latest astronomical observations and it should fully integrated into the causal and deterministic framework of the "Prime Theory" [1]. This model will not be about a multi-universe; anyway, we may still call it the First Bang, as it will propose a *single* type of event related to the creation of our Universe. What does this new model have to explain? For now, it has to elucidate the first moments of the formation of space and matter, and this is because the inflationary model seems to be satisfactory from a certain moment - the appearance of the structured matter - up to the present time, as it has been adapted by "The Universe" [2].

Some data, assumptions and comments to start from in shaping this new model:

a) We still are in the Prime Theory's premises area, where space has a granular component (material) and a geometric one (framework).

b) The total amount of visible matter (structured), compared with that of all supermassive black holes.

c) The assumption that the supermassive black holes from the beginning of the universe could not increase so much in a relatively short time, but in fact they all were born directly at this size. They shall still be regarded as some huge granular

agglomerations, as "The Universe" [2] described them in detail, but a number of new features differentiate them from the "normal" ones (those resulting from the collapse of regular stars).

d) The hypothesis that the density of granular space has had a maximum value in the beginnings, then it decreased continuously over time (seen within the isotropic frame of the closed universe). This assumption rests on at least two important findings:

- The spontaneous emergence of quarks during the first seconds of the universe (relatively big particles that were stable over time inside composite particles and which could no longer spontaneously appear now).

- The redshift of light coming from the distant galaxies, which is explained by the current physics especially by their movement (the Doppler effect) and by the "expansion" of space between them and observers during the long periods of time those photons have travelled.

e) The observation of a high degree of uniformity in the intensity of all gravitational fluxes, along every spatial direction - at a given moment. As long as the influence of the big cosmic bodies (they reflect and diffuse) on the distribution of granular flows is dependent on the square of the distance (the so-called "gravity"), the variations of these fluxes at a certain distance will get below a fixed value, i.e. they will become negligible.

f) The new estimate of the number of observable galaxies is around 2 trillion (as in the article [6]), 10 times higher than it was previously thought.

g) The rotation plans of the spiral galaxies, assumed to be determined by the rotation plan of their central black hole, do not intersect in a common point - and thus they are not reflecting a common, central point of origin, i.e. a radial direction of an initial linear momentum.

h) A very recent analysis, still controversial, regarding the brightness of some supernovas suggests that the expansion of the universe is not accelerating, as previously assumed.

2. Additional assumptions

There are two important assumptions to be mentioned now:

- The units of measurement of all physical quantities used to describe the beginning of the universe are abstract; they have absolute values and they will bear the same names as the current ones. However, in the definitive relativity we face inside a dynamic and closed universe, there will always be a perpetual uncertainty upon their absolute values.

- As it was previously stated in the "Prime Theory" [1], space does not expand in itself; only new zones are added to the edges of the sphere it supposes to form. However, its granular density changes over time, being affected by at least two components: the total number of granules in relation to the size of the three-dimensional space (by definition) and the number of the free granules that are integrated into particles (i.e. in structured matter, and photons are not included). The consequences of these variations in density are numerous; to an observer, the most important effect is the change of the speed of light in vacuum. As the granular speed ***C*** is an absolute speed, the velocity of photons will also have this special trait; this means they must have an absolute direction and a constant speed value in areas of constant granular density.

3. The speed of photons

In order to calculate this speed, we will consider now a cube of side ***l*** (having a big value, expressed in granular diameters ***d***) that contains inside a number of n^3 granules. Other scalar quantities have been denoted as follows:

C - the absolute granular speed, a constant

v - the current speed of photons

ρ - the linear granular density (n/l), ρ < 1, includes the collision probability

τ - the average time of a granular collision, $\tau \geq 1/C$, a constant

The formula of the absolute speed of photons simply results:

$$v = C / (1 + \rho \tau C)$$

It is very easy to see that this speed is always lower than the constant ***C***; moreover, it does not have a linear dependence on the granular density - as it may be clearly observed in Figure 1.

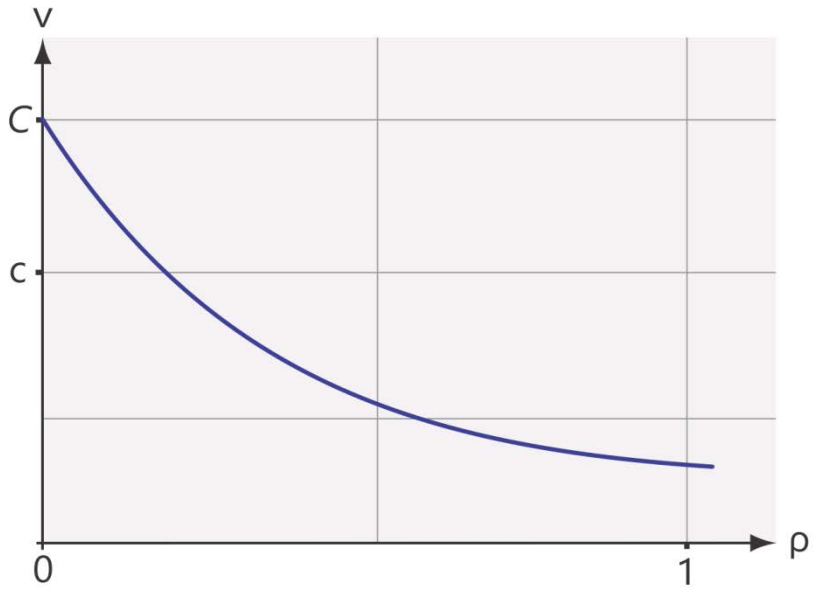

Figure 1 - *Speed of light - granular density graph*

Both the speed of light and granular density will therefore have a significant variation in time, as it is reflected (ideally) in Figure 2 from year 0 to year 14 billion (some rapid changes in density were ignored there - the moments when the first material structures formed and when the particles and antiparticles annihilated). We have to mention one more thing, the universe was considered a closed sphere that contains a constant number of granules and whose radius linearly increases in time. A similar graphical representation could be obtained if the horizontal axis would be the distance travelled by light.

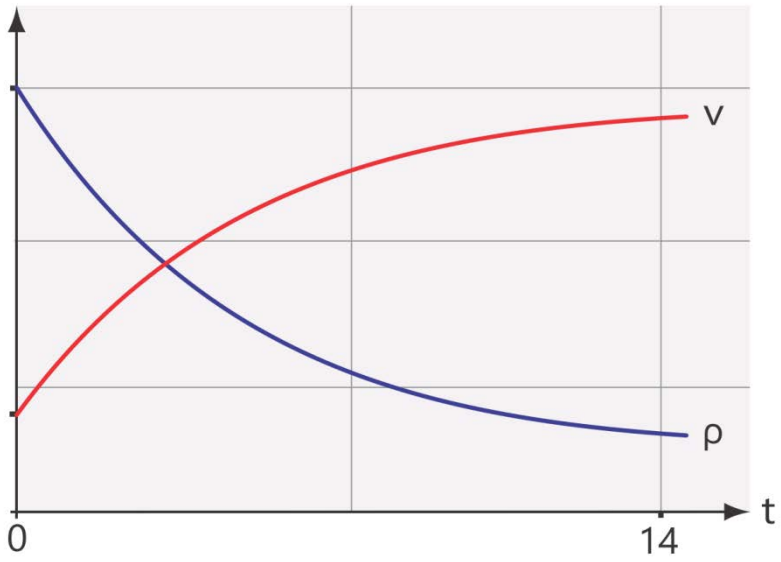

Figure 2 - *The speed of light and the granular density over time*

Remark

The laws of physics for all material structures are invariant in time. What changes in time, once the granular density decreases (and hence the intensity of the fluxes), are the absolute values of the physical quantities and constants involved in the mathematical formulas that describe their connections. It would have been a real cosmic beauty if all these measures were invariant or if they would change proportionally in time, but the reality of our Universe has a different, nonlinear dynamics.

4. The decrease of granular density

Here are a few consequences of the decrease of the granular density in time (the intensity of granular fluxes is also decreasing); all of the physical quantities included in this analysis are considered to have absolute measures.

- The mass of all elementary particles (and implicitly of the structures they belong to) will decrease. This produces, paradoxically, a surplus of granules that will persist continuously in the areas surrounding the massive bodies (stars, cosmic dust and galaxies). It simply results that the space around and inside galaxies will always have a higher granular density than the empty space (at equilibrium), and this may be a good explanation for the gravitational lensing effect (and for the "dark matter") produced by galaxies. This phenomenon manifests in addition to the usual increase of granular density in vicinity of cosmic bodies (caused by the partial diffusion of granular flows - the omnidirectional reflection on matter's constitutive atoms and molecules, which is related to the "classic" gravity).

- The electric charge is very likely to decrease due to the reduced surfaces of charged particles.

- Time, seen as a resultant of the proper oscillation and vibration of particles, will have a higher rate.

- The electric and magnetic fields: their intensity will decrease.

- The size of the physical bodies: it will increase a little due to the lower intensity of all fields.

- The speed of photons will increase (it was shown in the previous chapter).

As it was already stated, all these variations cannot be measured as long as they have a common cause - the granular flows - which equally affects the metrics and the measuring instruments we are using. This generalized relativity, which makes these variations to be unperceivable to observers and prevents the acquisition of their absolute values, still has a component that allows us to compare those quantities over extended periods of time. It is about the *finite speed* of light, a feature that was always present in our universe and to which we should add the huge distances the light can travel. This combination of things allows us to peer

deep into the past, to see the formation of the first stars and galaxies and even the radiation emitted by the first particles.

5. Observations and analyses

In the light of the above statements, here are a few remarks about the latest astronomical data collected by astrophysicists:

- A truly supermassive black hole lies at the center of most galaxies; these "old" stars actually allowed the galaxies to form and shaped them from the beginning. As these special black holes (the prefix *proto* will be added to their name) were not born normally, from some collapsed stars, it is reasonable to consider a different birth mechanism. Even if the granular density would have been, let's say, ten times higher (is the year one billion) than it is now, the size of these proto-black holes (billions of solar masses) could not have a real theoretical justification in the current physics.

- The almost equal intergalactic distances could not be justified by a sort of "central" explosion, in which the entire "energy" concentrated within that strange "singularity" would have spread through space to this degree of uniformity.

- As stated in Chapter 3, under the assumption of a higher granular density in the past, it is possible that the frequencies of light emitted by the first galaxies (one billion years old for example) to be different (a lot smaller) than those of today. If we corroborate this thing with the decrease of the granular density in time and with the increase of the speed of light during its journey towards the today's observers, we may conclude that the recorded redshift of the light coming from distant galaxies no longer means so big distances and neither so big get-away speed. Consequently, we simply need to recalculate the size of the observable universe. Moreover, as the galaxies are not moving away and from each other the way we thought before, the main justification for the Big Bang model and the related cosmic inflation is no longer valid and therefore this whole scenario has to be reconsidered.

- The same thing happens to the other radiations emitted at the beginning of the universe, e.g. those of the 21-cm line (H) - which are now reaching us with much longer wavelengths.

- Interestingly, the Hubble's law is not seriously affected by the variation of the speed of light over time. That proportionality deduced for the big cosmic distances is still valid, but their absolute values will decrease and we should fix them by using the new formula for the speed of light.

A more precise quantitative analysis should be made here, as the photons emitted at the beginning of the Universe have a different internal structure and they underwent several modifications during their journey of billions of light-years. For accurate information about the age and speed of the distant galaxies - both deduced from the color of the received photons - some important factors should be taken into consideration to correctly adjust the cosmological data:

- The speed of light at the time of emission was smaller than today, as the granular density of space had a higher value in the past.

- The frequency of those photons, for a today-equivalent atomic transition (color) at an identical rate of time, is smaller. This has caused the first redshift of that light, which practically depends only on the age of the distant galaxy.

- The length of those photons emitted in the past may change significantly as the granular density of space decreases during their journey. Their internal structure will be generally maintained, except for the substantial dilation along the direction of propagation; therefore, their intrinsic energy - related to the granular density - remains unchanged over time.

- As their wavelength has increased, these photons will have a lower frequency and, apparently, smaller quanta of energy are transferred to the receivers.

As all the parameters of matter vary with the change of granular density over time, a new mathematical model to describe their evolution becomes absolutely necessary. These new formulas might compensate for the global relativization of

all physical quantities in time and thus we will be able to compare data of the same kind, of absolute nature.

6. The distributed birth model

If space would have expanded by an increase in itself, the matter (in any form) could not have been moved in the process and, at the same time, to remain at relative rest. The theory of cosmic inflation cannot be accepted for this very reason; moreover, it postulates another unacceptable thing, namely the space has expanded in the first fractions of a second after the Big Bang with superluminal speeds... We know, the geometric space is not something material and therefore it does not have a speed limit. On the other hand, space has been created in this very explosion by the expanding "energy", and it would simply result that this strange energy does not have a speed limit too! Furthermore, all of the existing "energy" concentrated into an infinite dense point, an infinitesimal "singularity"... these things do not quite fit into the framework of a causal and uniform physics (which would be normal and which may apply at any moment), even on a speculative level.

The observations and assumptions mentioned above led me to an alternate birth model of the universe, in which the actual astronomical measurements are all included and reflected. Fortunately, this model can be developed without the help of a mathematical formula expressing the decrease of granular density and the absolute variations it induced to the other physical quantities over time.

Since we are not able to define the primordial "nothingness" (The Universe [2]) - due to principled reasons and due to the lack of concrete references - as being the source of the empty space and of the granular matter, the initiation of a cosmic genesis will actually remain with no logical and energetical justifications. In order to compensate this and to give coherence to the distributed birth model, my previous theory will be changed a little bit by the addition of a few new assumptions.

a) The primordial "nothingness" will be considered from now on as a primordial "something", namely an elementary form of matter being in a certain state, which already occupies a certain "place" and already contains mechanical energy. Whether the "sum" of matter and space is zero or not (i.e. these two physical components have emerged from nothing) represents an big issue that will remain open to debate. Similarly, what is the size (the amount) of this raw material? Is it infinite or not? Whatever its size would be, this primordial material - which will hereinafter be referred as "*essence*" - has two special features: perfect elasticity and three-dimensional form (the white background of Figure 3A).

b) The essence, which may now be imagined as a uniform and very dense "cloud", undergoes a continuous process of expansion and therefore its density may reach a minimum value, a threshold below which this raw material can no longer hold its internal cohesion (Figure 3B).

c) At a certain moment, this process of expansion produces a multitude of "ruptures" in the fabric of that primordial essence, i.e. some tiny spherical holes, uniformly distributed, which are expanding themselves along with the raw material (Figure 3C).

The assumptions above actually represent the initial stages of the *implosion* event this cloud will go through, indicating a distributed process that gave birth to our granular Universe. What happens next inside these hypothetical empty spheres? And what are they exactly?

Obviously, these formations actually represent some volumes of absolutely empty space, i.e. what remains there after the raw material withdraws. We cannot define now all the properties of these things, but we may state instead they are the source of the uniform and isotropic *space*, of those places where the matter of any kind can freely move. From a geometric point of view, space may be perceived as being a three-dimensional framework of Newtonian type, perfectly linear, which does not interact with matter in any way. Unfortunately, at this moment we cannot say whether this space is infinite or not, nor if it would have been existed anyway - even in the absence of the primordial matter - as a "place",

as a truly fundamental "nothingness" or as a kind of support for all the future material things.

Note. If space (seen this time as absolute nothingness) would have been there anyway and if the amount of essence would have been finite, we then could have take into consideration the existence of other primordial clouds and of their baby universes - but we are not ready yet to speculate so far.

Each of these spheroids described above will undergo a process named *First Bang* (a kind of *localized implosion*) that occurred almost simultaneously throughout the entire volume of essence. Thus, this implosion phenomenon seemed to propagate at a very high, yet finite speed (we cannot compare it now with the speed of light). Here are some specific characteristics of this distributed process that has generated the space and matter:

- Those primordial "bubbles" of space, i.e. the "empty" spheres that have been formed within the entire volume of essence, were almost evenly distributed; moreover, all of them grow very fast, increasing in size at a constant speed.

- The whole surface of these "bubbles" goes through a change of state (we can also name it division); the essence of these areas undergoes a transition from a contiguous-type material to a granular one. This phenomenon is quite similar to the well-known evaporation process that occurs when a liquid reaches the boiling point. In other words, the essence-space interface will continuously generate granular fluxes that are normal to the tangential plane of the emitting surface (Figure 3D, where you can see these fluxes).

- The omnidirectional, very dense granular fluxes will start to flow shortly, concentrating into the center of each sphere of empty space; thus, their granules will soon come to bump into each other. As the granular density will become extremely high in this area, all the incoming fluxes will curve and will thus converge towards the center. Therefore, many huge vortexes will form in this particularly dense granular material (via a process similar to the formation of elementary particles, but the scale is much higher) and will concentrate in the central zone (Figure 3F). Taking into account the possible granular unevenness,

these vortexes will soon get a global movement of rotation in the dominant direction at that time. The "solid" body that is born this way is "fueled" by the new fluxes and keeps increasing in size until a state of equilibrium is reached (a balance between the centrifugal forces and the external pressure).

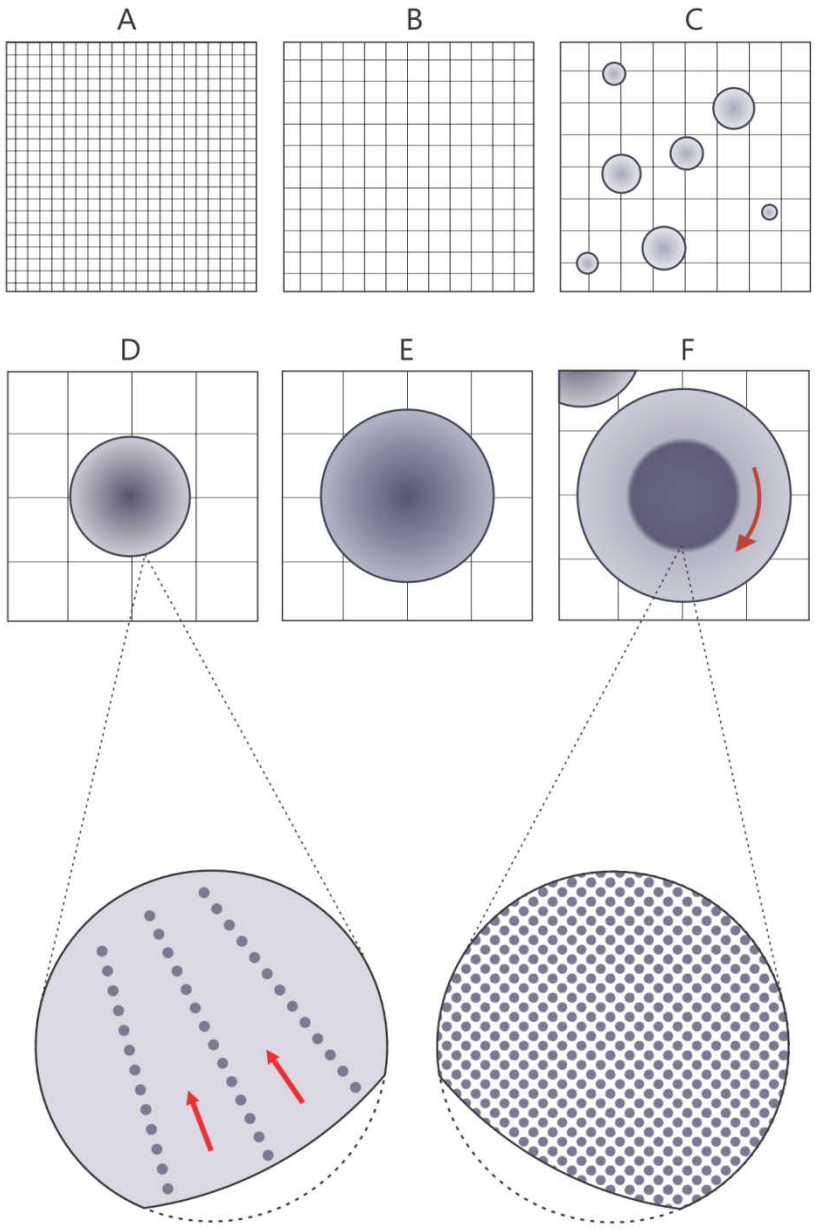

Figure 3 - *The initial stages of a First Bang*

- These compact granular structures are in fact the proto-black holes of our Universe, primordial supermassive formations that were born directly *big* and which will soon gather the nearby clouds of structured matter. They will continue to grow (not significantly) by accretion, "eating" the gaseous matter around and other nearby stars. It is likely that their diameter will additionally increase with the global decrease in intensity of the granular flows.

- Each of those "bubbles" of space grows rapidly and, at a given moment, will merge with the adjacent ones; thus, they eventually form a single huge bubble, *the space*, an empty volume that is only populated by proto-black holes. The granular flows will overlap and join together, getting even in a relatively short time. This new scenario of the Universe's birth may have two different continuations, depending on the size of the primordial cloud of essence:

1. Infinite size - an open or closed universe is no longer relevant; however, in this case we cannot justify the expansion of space and the decrease of the granular density in time.

2. Finite size - now we can make an important distinction:

a) Closed universe - the most likely case. The granular material is no longer generated (the number of granules and their energy will be conserved), but the granular pressure will determine a continuous expansion of space - which justifies the rate of decrease of the granular density.

b) Open universe - all the granular material would have been spread continuously in the great cosmic emptiness and thus the average density would have dropped much faster - the unlikely case.

A birth model that is based on a distributed process of creation allows the newly formed universe to support all of the granular laws and postulates [1]. As the local granular impulse is quasi-null in those embryonic zones of space, the grand total will also be null at the merger moment and afterward.

The most important aspect of the process described above is the *uniqueness* of the primordial cloud of essence and the attribute of *absolute* it generates. This

natural attribute is inherited by the newly born universe, becoming an intrinsic quality. Therefore, the physics of this new universe will have an absolute spatial reference that must be reflected in any law and theory we draw, at any scale, in correlation with another intrinsic quality, namely the *relativity* imposed by the great uniformity of space [2].

Note 1. The gravity exerted by the proto-black holes, seen as a perturbation in the uniform distribution of the local fluxes, has a maximum possible value and it no longer depends directly on the star's mass. As this value is only determined by the opacity and the diameter of the stars (assumed spherical bodies), gravity will no longer depend on their internal structure - which thus can be reduced to an *empty* spheroid. If a black hole expands with the decrease of the spatial granular density, this inner emptiness may also grow in size and the star's peripheral speed may decrease until the dynamic equilibrium is reached.

Note 2. This First Bangs model justifies a sort of macro granularity of space in the beginnings, if we take into account the very big distances between the proto-black holes (thousands, even millions of current light years) and their small initial linear momenta. If there will be a global expansion of these newly formed galaxies, it will be only caused by the gravitational gradient that is present on very large cosmic distances.

Note 3. No more black holes may form through this mechanism; the special conjuncture - a huge granular density and a massive concentration of fluxes in a limited area - can never be repeated in the actual universe.

7. Conclusion

The model we have shown here has mainly started from this question: why there is a massive black hole located at the center of most galaxies? Trying to answer that, this model has succeeded to integrate my granular theory and all of its laws, being also in harmony with the newest celestial observations (of the distant galaxies and of the cosmic background radiation). Furthermore, the concept of absolute is maintained during the distributed birth of the universe, being a key element in explaining the emergence and the evolution of structured matter. The First Bangs hypothesis starts from a very small number of assumptions and possesses a real logical consistency; it also provides full explanatory solutions for the first moments of the universe and for its evolution laws. Once again, the new granular physics has helped us decipher the deep mysteries of the surrounding nature, allowing the development of a complete, deterministic and rational theoretical model of the universe.

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