

## **A Non Inflationary Expanding Universe**

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### **ABSTRACT**

A proposal is made that nature of particle formation and ejection in the earliest moments and minutes of a universe was on fronts leading to a fundamental understanding of the Hubble law and limit. It is proposed that at the earliest times of the universe matter moved out at different times and rates that have continued unabated except for “minor” loss in the heat range.

### **1. INTRODUCTION**

A model is proposed for the Kernel Universe which is characterized by non-uniform velocity conditions behind the front face of the Universe, but which past the Kernel Universe are constant locally. It is a model not used as near as I can detect in my travels towards understanding origins and futures of the Universe. Admittedly my travel in this field though relatively long has been markedly and shallow especially given my engineering relies on Newton. The speed of light in a vacuum is a known fundamental parameter of the universe. Further the constancy of the speed of light,  $c(s) = \text{constant}$ , in all frames of reference as found by Michelson and Morley in 1887. It was left to Einstein to “create” a new but “bizarre” universe from that finding though he too existed only our normal living speeds. From that beginning a modern understanding of the birth and birthdays of our universe became possible. Hubble’s law has been partial driver of such models, although there is a question as to the amount of matter in the universe being too low. The present model does not seem to require a consider of the total energy/ matter in the universe to be fully consistent.

### **2. HUBBLE LAW**

The Hubble’s limit, or age of the universe, (a limit I personally like) has surfaced as derived from Hubble’s Law. The Hubble Law, apparently a non-fundamental law ( $V=HD$ ), is intriguing because it “works so well”. The Hubble limit represents perhaps the boundary between no time and time, or may have been in the early universe.

#### **A. HUBBLE AS THE OBSERVER**

The Hubble law is “precise” across billions of light years.  $V=HD$ , where  $V$  = velocity of matter,  $H$  the Hubble constant, and  $D$  the distance from an observer to an object in the sky. In part based the spreading of the universe in accord with the Hubble law models of the origins of the universe can be developed, which were described in part by Einstein,. The relationship has caused some to guess at what gravitic attractor might exist at or beyond the Hubble limit, plausible perhaps at the junction of two spaces, but not considered here. From the standpoint of the observer on a raisin, like raisins in a loaf, the law measures the spread of raisins and matter. Not only is matter spreading, but also the space around the matter is spreading.

#### **B. MEASUREMENT**

$H$ , the constant in the Hubble Law, has seen a reported value decrease by an order of magnitude with continued measurement over a period of about 70 years. The measurements to derive the law though might be viewed as though at taken almost a single point in time along an almost “straight” line or even almost a point in space. It is worth wondering in another paper, whether the law is a law at all, but I find it elegant at this point for ease of use. Perhaps the measurements like any tangent measurement at close proximity may appear flat, a result understood in Euclidean and Fractal mathematics, that closeness changes the appearance. The suspicion is the Hubble law, if it exists at all, may be a non linear equation equation. In Table 1 are measured velocities and distances. Further since in the model velocities are known at all times (less any losses to background radiation), the locations of the measured components, assuming a straight line velocity profile are presented in Table 1 and new values for the Hubble Law constant estimated.

### 3. VELOCITY IN THE KERNEL UNIVERSE

If one takes the assumption of a Big Bang at face value then let the Kernel Universe be the universe within its first few seconds or minutes. The assumption has been that the “Big Bang” represented energy and matter at a constant velocity of  $c$  and at a high degree of uniformity which is thought to be confirmed by the absence of large variations in the background energy between the Hubble Limit and the observer. The assumption of constant velocity and uniformity is perhaps overstated.

#### A. NON UNIFORM VELOCITY

It is proposed herein that the outward front initially moved and still moves at the speed of light. Further it is proposed herein that there was initially not a uniformity of forming or velocity of expansion of matter within the kernel universe. The velocity if uniform in any respect was so only for a given radius or given locality (which seems suspect). Behind the front though matter moved at less than  $c$ . Barring minor changes, because of losses to heat, movement has continued outwards at  $c$  or a fraction thereof since the Kernel Universe. Based on this understanding the relationship  $V = HD$  is an obvious and fundamental outcome. There is no need to account neither for gravitic attractions at boundaries to account for increasing  $V$ , nor for the fabric of space to be stretching. Locally gravitic wells may still develop.

#### B. OPEN EMPTYING SURFACE

I propose a universe similar to an open emptying surface, out of which reality is falling, galaxies, photons, radiation, black holes and all. As a picture, the universe may be no more than a teeter totter loaded fully and in balance with billions of Euler instabilities on a sky scraper, which on losing a single ant irrevocably and inexorably, with next to no change in energy tips divulging all or many of the instabilities. The loss of stability can never be recovered, it is a one way loss, backward movement is impossible without applying a much larger energy than the energy of formation. The total energy to cause the formation of the Big Bang may then be next to zero yet the total energy past formation depends solely then on the number of instabilities the “sky scraper height”, and the energy is never recoverable. The universe then still always satisfies the law of conservation of matter and energy, of momentum, and of entropy. The initial unfolding of the instabilities will eventually lead to barriers against further instability breaking, at which point the teeter totter rests again, and the Big Bang ends.

#### C. HUBBLE AS AN OUTCOME

If one accepts the premise of initial velocity being on average  $c$  and a fraction thereof, one can postulate in this universe a relationship  $V=HD$  where  $D$  was the distance when the object emitted its light toward earth. Thus objects at 1 light, 1000 light years, one billion light years, and so on, but measured at the same instance conform to the relationship  $V = HD$ . The relationship of velocity and distance and time may then be laid out as in Table 1 and demonstrates a stickiness in the Kernel Universe.

#### D. AGE OF UNIVERSE

The ages predicted by an open non inflating but expanding universe are consistent with those based on other understandings (Table 1) and would be on the order of 10 to 20 billion years. Based on the understanding of a Big Bang with a front velocity of for the energy and first matter created and for a other front materials with a velocity of  $a*c$ , where  $a$  is a fraction less than one we get an estimated age of the universe fitting the observations and fitting  $c$  being a constant (at least as accurately as the present methods. Red shift will still be useful in predicting the velocity of the matter. Based on this understanding the earlier parts of the Kernel Universe are those most distant. The velocity profile also provides an indication of the nature of the Kernel Universe. It is interesting to note that in the model proposed suggests all matter is essentially of the same age. It seems likely, those objects most distant from the original Kernel, might contain most of the matter able to be formed under the highest temperature and energy regimes.

#### E. SUCCESSIVE FRONTS

The forming moments of the universe are proposed herein to be for an open expanding universe with no possibility for rebound with potential open age. In this case the Hubble limit represents the original front of the Big Bang. Behind the Hubble limit, all visible matter at  $a*c$  will remain visible beyond the Hubble limit but will never reach the limit. Each successive front is represented by a bit of energy and matter concentrated locally. The gap between the first front and later fronts (that is slower materials) will expand while the matter endures, gravitational gradients becoming forever smaller as distance increase and

as mass and energy become converted to background radiation. As matter expands outwards, the density will become more and more sparse, so that structures presently visible will become more and more to represent decreasing islands in independent motion and “arbitrary” location, reflecting the original micro fluctuations in the Big Bang. It is interesting too that that primordial EM expands for the entire Kernel at  $c$ , but that the matter travels at  $a*c$ , creating an apparent discrepancy in the EM-Matter balance. Given the entire Kernel EM moved out simultaneously (within seconds and minutes, or even 300,000 years), the front or the Hubble limit, contains the bulk of the EM energy. Integrating backwards from the front face all known energy and matter, using their time and matter, should provide a better balance, although the EM energy is in a narrow radial band, where it will apparently not been seen again by mankind, except in reflection or EM black body radiation form.

TABLE 1  
TIME DISTANCE RELATIONSHIPS OF THE UNIVERSE

Object+	Virgo	Corona Borealis	Bootes	Hydra
Time Since light Left Object(yrs)+	$6*10^6$	$1.5*10^9$	$2.8*10^9$	$4*10^9$
V – Velocity Today (a in $a*c$ )+	0.004	0.07	0.13	0.2
D - Apparent Distance (LY)+	$0.00634*10^9$	$1.440*10^9$	$2.749*10^9$	$3.960*10^9$
Estimated H in Linear Relationship $V=HD$		$4.58*10^{-11}$	$4.58*10^{-11}$	$5.78*10^{-11}$
Estimated Age (billion yrs)		22	22	17
Actual Velocity Today (a in $A*c$ )	0.004	0.07	0.14	0.2
Actual Distance (LY)	$0.00637*10^9$	$1.541*10^9$	$3.133*10^9$	$4.752*10^9$
Estimated H in Linear Relationship $V = aHD$		$4.29*10^{-11}$	$4.39*10^{-11}$	$3.71*10^{-11}$
Estimated Age of Universe( $V=KD$ ) (Billion of years)		23	23	27

+ distances and like from standard texts and references (1,2)

#### 4. SUMMARY

A model is proposed of the few first moments of the universe in which the on different fronts from the Kernel event varies. Further the EM velocity is  $c$  on all fronts. A separation of the EM and matter fronts occurs. The separation of matter can then be predicted to follow a Hubble law. A non-inflationary expansion of the universe is hinted at. Hubble’s Law it is thought would fit such a universe, but the author hints with due respect to the elegance of the proposition of the Law which may need to be revisited.

#### 5. ACKNOWLEDGEMENTS

The author acknowledges he has been inspired by those who have dared to stand in the shoes of God including Newton and Einstein, and by those lesser angels of Galilei and Laplace, with their hosts, to try to see through the next cloud.

References besides standard texts:

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