

## **Cosmology-Galactic Renewal**

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**Abstract.** The Observable Universe is seen as a tiny sample of an infinite ocean of galaxies, a self-evident existence that is engaged in a constant re-cycling of its galactic ashes and debris into new galaxies at an efficiency of 100%. The motor that drives this re-cycling is gravity. Galactic clusters are built into massive arrays and, in time, build the central galaxies, the Seyferts, out of which are born the Quasars, the precursors of new galaxies, a la Halton Arp.

### **Introduction.**

Cosmology, as presented to the world, is based on the idea of an Expanding Universe (EU) and a Big Bang some 15 billion years ago that supposedly launched it. This is seen as an explanation for the redshift as observed in the light of distant galaxies and accepted in lieu of any other plausible explanation.

This paper rejects that explanation and is based on the assumption that the Universe we observe, the Observable Universe (OU), is but a tiny portion of an infinite and eternal ocean of galaxies, and that this ocean of galaxies is in a continual process of galactic death and rebirth.

### **The Point of Beginning:**

Our point of beginning in the study of Cosmology is the acceptance of Existence as a self-evident fact, as an axiomatic concept that cannot be refuted. From this, if we would rule out magic, we must conclude that existence exists everywhere, so that this ocean of galaxies that we call the Observable Universe (OU) actually extends in every direction to infinity! In a like manner we must conclude that the OU, and Existence of which it is a part, had no beginning and that there will be no end. It is eternal!

This being so, and observing that the OU is vibrantly alive with beautiful galaxies and nebula after an eternity of being, despite the fact that the stars of the galaxies are all busily burning themselves up, spewing stellar winds and energy and other debris into space, we must conclude that the galaxies of this Infinite and Eternal Universe (I&EU) are, in some manner, involved in endless cycles of galactic renewal of 100% of these ashes---these material and energy masses.

It is the renewal mechanism that must be developed first, explaining just how galaxies can grow old and die only to reappear brand new and vibrantly young to begin the aging process all over again. Is there evidence? Are there segments of the full cycles to be found? The answer is "Yes", and they will be presented first in outline form, and then revisited to fill in some of the details.

## **Outline of a Cycle.**

Many years ago Halton Arp discovered that the largest spiral galaxies in the Universe, the Seyfert's, were ejecting smooth bright objects that were identified as quasi stellar objects (later reduced to Quasars) every several billions of years, and, more recently, Arp learned that as the Quasars traveled away from their parent Seyfert they started to become "fuzzy" and still later they evolved into normal galaxies.

Along around the same time it was learned, as reported in Harrison's book "Cosmology", that most of the galaxies in the Universe resided in clusters of galaxies and that these clusters had various populations of galaxies ranging from only a few up to over a thousand, apparently brought together by gravity and caused to grow by occasional collision. It was also observed that as the numbers grew a central galaxy came to dominate the cluster and that the dominant galaxies were invariably spirals that had active nuclei, i.e., fell into a class called AGN's (for active galactic nuclei). It was also observed that the most dominant of these AGN galaxies were Seyfert's!

The Cycle is obvious. Gravity brings together more and more galaxies until a certain critical mass and density are reached in the central region at which the dominant galaxy, a Seyfert, is triggered to undergo a nuclear (?) transformation in its core at which the Quasar precursor mass comes into being. Given that there are two Quasar's ejected in opposite directions, apparently out the poles of the Seyfert, one could suppose that the ejections are driven by magnetic repulsion. However driven, the Quasars are on their way.

## **Galactic Clusters:**

In "Cosmology: The Science of the Universe", by Edward R. Harrison, Harrison discusses "Clusters of Galaxies." Pg. 58. In this book he states that "Galaxies are not uniformly distributed.....the majority.....are members of clusters." "The regular clusters are spherical and have a strong central condensation of galaxies.....These cluster are rich - meaning that they have many members - and contain a thousand or more galaxies that are mostly of the elliptical and SO kind. Often in their central regions are found super-giant ellipticals that have conceivably grown to their colossal sizes by gobbling up smaller galaxies.....They contain intergalactic gas...." "All other clusters of galaxies are of the irregular type. These irregular clusters have various degrees of richness and are far more numerous than regular clusters.....Irregular clusters range from rich aggregations of more than 1000 members,....to groups of 10 or fewer members.....Our Galaxy is a member of the Local Group, which is an irregular cluster of approximately 20 galaxies.....Spread out in space, beyond the Local Group, are multitudes of other groups of galaxies.....The Local Super-cluster that we occupy has its centre somewhere in the vicinity of the Virgo Cluster."

Not mentioned by Harrison, and more recently in the astronomical news is the fact that space is also a place of voids, some being described as "great voids" - between the

clusters. This, of course, is to be expected in view of the clustering.

Evident in this discussion is the fact that the clusters are growing. Normally isolated galaxies floating through space come close together being gravitationally attracted but then, quite likely, they are magnetically bounced away only to approach again some millions of years later, and after a number of such skirmishes eventually do merge. Such collisions are seen throughout the OU, in that there are perhaps billions of growing clusters constantly at work. No limit is suggested in Harrison's book for the growth of these clusters although we'd have had a problem, given an eternity of growth, unless there were some sort of built-in limits.

### **The Burning of Stars:**

Note that the galactic clusters, in collecting and providing mass for the Seyferts, will accumulate galaxies and gaseous mass as well as other debris in the affected space. The energy mass, which is also gravitationally responsive, is drawn towards the clusters but will be compressed only so far due to an apparent self-repulsive characteristic. (More on this later.) The amount of compression is a function of gravitational forces at varying distances from the cluster center and increases as the overall gravity increases.

Note that the energy leaving the stars is part of the overall cycle. It is no longer consigned to be "dissipated in space" and forgotten, as seems to be being done in most books on astronomy.

### **Redshifting of Galactic Light:**

The observation which led to the Expanding Universe hypothesis is the Cosmological Redshift, or CRS. While an EU is nonsense, the CRS is real and becomes evidence supporting the IEU hypothesis.

Back about 1930 Edwin Hubble discovered (or confirmed) that a great many of the nebula seen in the night sky were actually full-fledged galaxies like the Milky Way. Then, a few years later, he discovered that the light from these distant galaxies was down-shifted in frequency, and still later that their redshifts were greater as their distance from Earth became greater, i.e., the size of the redshift was some function of distance! This redshift became the Cosmological Redshift (CRS).

Once the Astronomers became convinced that this was actually what was happening they were faced with the problem of how such a CRS could be generated. They considered several possibilities, such as "tired light" and other far-out ideas, and finally settled on an idea that is an outgrowth of the Doppler Effect, wherein if the galaxies were traveling away from Earth their light would be red-shifted as a function of the speed at which they were traveling. The greater their speed the greater their redshift, and so it appeared that the greater the distance from the galaxy to earth the greater their speed of recession. The Universe was expanding, they concluded (driven by a Big Bang!).

This posed the problem of what to do when the recessional velocity approached the speed of light. To circumvent this problem they decided that it wasn't really the galaxies that were receding, it was the space between them that was expanding, and then, with some fancy math., they had this space behave in an acceptable manner at great distances. They got what they felt was the increase in the speed of recession (near in) by comparing distances found by other means to the redshift distances and obtained a rate of recession, that they called the Hubble Constant, of 70 km/second/mega-parsecs/second.

Of course, in an infinite ocean of galaxies one cannot have expansion, nor any other unending unidirectional movement. This requires that another mechanism for creating the CRS be found, one which is always at work. Dr. Thomas Smid, of the UK is working on a model which uses electrical fields in space which do the job, except that it fails when the frequency of the electro-magnetic (em) wave falls too low. Others may have other ideas, but none can be allowed to pose an actual loss of energy. Space (the aether) is the carrier of the em wave and in and of itself cannot dissipate power.

### **Generating a Redshift.**

A mechanism for generating a redshift in a single local increment of space follows:

Assuming that the increment of space has an initial density and that we transmit a beam of light of a given frequency through that increment. A certain number of wave fronts will be generated in that increment. Now, (by magic) we increase the density of that space by a factor of two. The number of wave-fronts now being generated by that same input frequency in that space is doubled, but, in that the greater density is constant the output frequency has not changed (but has been delayed a bit more). Now, return to the initial density and increase that density over a one minute period at some constant rate, and read the frequency **while the increase in density is in process**. Not surprisingly, the frequency is lower by some fixed amount due to the fact that additional waves are being absorbed by that space also at a constant rate. For the duration of the increase the output frequency is equal to the input frequency less the rate at which wave-fronts are being added to that increment.

Exactly how this mechanism may be applied in the growth of galactic clusters to cause the various redshifts seen will be explored in the next section.

### **Redshifts and Galactic Clusters:**

It was pointed out earlier that the energy leaving the stars had mass and, of course, anything that has mass is subject to gravitational attraction. This is especially important with the Galactic Clusters in that all of the energy in the space surrounding the Clusters (in their sphere of influence) is affected by their immense gravity, just as are all galaxies, and so, as energy is spewed out of a star it immediately begins to be drawn towards the Galactic Cluster. If we apply the formula for the gravitation force to the energy leaving the most distant stars affected by the gravity of the Galactic Cluster we can expect it to start becoming more dense the moment it is freed from its star of origin and to continue

to increase in density as it travels, due simply to the fact that there is energy converging from all directions.

Now what happens to the energy as it nears the gravitational center of the galactic cluster is that its density increases ever more rapidly and therefore that the redshift produced over a given distance traveled through that more dense energy is ever greater. This is what we see as the Intrinsic Redshift near the central regions of the galactic clusters where the Seyfert galaxies are, and where the Quasars are produced, and this is why the Quasars, and other objects in the vicinity seem far more distant than they actually are. As the Quasars travel away from their parent Seyfert galaxy they are traveling outward through an incoming energy that is progressively less dense so that their redshift is seen to be progressively less, just as is observed.

### **Fingers of God.**

Re-examining what was just said, that in the flow of the energy towards the center of the galactic cluster the energy density continually increases, it can be seen that the energy has been formed into a Luneberg Lens encompassing the galactic cluster. It is these spheres of energy that comprise the Lens that those writing of "Fingers of God" speak of as "redshift space", and it is the diameter of these spheres that the "Fingers of God" define, down to where their density is not too different from that of adjacent space.

### **Gravity, the Prime Mover.**

In all of this, Gravity is seen as the Prime Mover at innumerable locations through-out Existence; engines forever at work pulling in galaxies of stars, with their gases and energy, toward centers of what has become gigantic galactic clusters, out of which the Seyfert galaxies develop only to randomly eject the Quasars destined to become new galaxies, galaxies that eventually join new clusters at which the cycle repeats over and over again, forever.

### **The Seyfert Galaxy:**

Left open in this paper is the activity; within the Seyfert's that produces the Quasars. It would appear that the Seyfert grows in size until it reaches a critical size at which it triggers a nuclear reaction and an explosion occurs that, despite its power, is fully contained by the mass of the massive Seyfert. This reaction then transforms a portion of the Seyfert core into the atomic mass and material that is required for the production of the two Quasars that are destined to become full-fledged galaxies.

### **Energy-Intrinsically Negative?**

In high school we were taught that "A moving charge generates a magnetic field." To prove the point a battery was connected to a solenoid wrapped on an iron core and, behold, we had an electro-magnet, caused by the electrons (the charge) flowing around the turns of the solenoid. Reverse the battery connections and the magnetic field reversed

due to having the same charge moving in the opposite direction. We also learned that the magnetic field from a solenoid was a function of the product of the current flow and the number of turns of wire. Ten turns with one ampere = one hundred turns with 0.1 amperes = one turn with 10 amperes.

Some time later we were told that the Earth got its magnetic field from “a circulating molten iron core”, with no mention of a “moving charge”. Realizing that a “charge” would, of course, be necessary and that the planet’s rotation was the probable source of the “motion” it was concluded that the planet’s “magnetic field” was actually an electromagnetic field with the Earth being a single-turn solenoid and carrying an electric charge.

Proceeding on this premise it was decided to determine the size and polarity of the electrical charges required for each of the Sun’s planets to produce their magnetic fields, and to see where this might lead.

Only the Earth, Jupiter, Saturn, Uranus and Neptune had adequate data to go by (See Appendix), with the planet’s size, speed and direction of rotation, and the strength and position of it’s magnetic field, being required. All planets were viewed from above and seen to be rotating counter-clockwise and all, except for the Earth, were seen to have North as the uppermost pole. As the Earth has a geological history of pole-reversal, and as the Earth is the only planet with an atmosphere, it was concluded that occasionally this atmosphere, which forms a capacitor with the Earth and its Ionosphere being its two plates, was being shorted out due to some cataclysmic event on the Sun allowing the Earth to be positively charged for a period of time and during that time to behave like the other planets being studied.

Anyway, the most amazing thing discovered was that every planet, except the Earth, was carrying an immense positive charge, while the Earth was carrying a similarly large but negative charge and presumably would also have a positive charge during the periods of magnetic field reversal.

The Sun was considered to be the source of this charge, courtesy the Solar Winds. Numbers taken from astronomy textbooks for the mass lost by the Sun are:

Solar Wind mass loss	$9 \times 10^{13}$ grams/sec.
Solar Energy loss	$0.444 \times 10^{13}$ grams/sec.

(Note that the mass loss in energy is about 5% of the total mass lost/sec. by the Sun. It is believed that this energy is the unrecognized aether which we know must permeate all of space.)

A positive Solar Wind would require a positive Sun, and in order for the Sun to be positive it must be losing its electrons (its negative charge) via the energy outflow. The final conclusion is that the energy in space (it’s aether) is negative, perhaps intrinsically so. It is this negative-ness that gives it its critical self-repulsive characteristic. And, as stated earlier, it retains its mass and is therefore gravitationally responsive, a second

critical characteristic.

### **Where does this take us?**

The discrete electron is now a fluid, of sorts, an aether that is negative but, not having a charge, per se, cannot further charge anything or accept an additional charge. Hence, the use of the term “intrinsically”.

So now, in review of the earlier portions of this paper, we may surmise that the electrons from the stars are used to create the aether, and that the aether must be consumed to re-create electrons in the Seyfert/Quasar transition to become new stars in new galaxies.

The aether is believed to permeate all of space from inter-galactic to intra-atomic. The, not unreasonable, question that rises is: Can we feel or use the aether? Here, the answer is “Yes, indeed”. The magnetic field that we generate with an electro-magnet is a flow of this aether, made to flow using an electric current (of electrons). The electro-magnetic waves that we transmit through space are transverse waves launched in this aether, waves generated by antennas in which electric currents are flowing back and forth. The EMP from our atomic bombs is an expanding sphere of aether. X-rays and lasers are special uses of the aether, as is radar. The list is long.

And, of vital interest, **the aether is energy! We are immersed in energy.** And so, the folks looking for “free energy” may not be without hope. To date, they just haven’t had a decent description of the characteristics of that energy with which to work.

### **What is the density of the aether?**

Professor John Wheeler calculated that it was the equivalent of  $1 \times 10^{94}$  grams per cubic metre, back in the 1960’s. That sounds a little high to me, but, to gain a little perspective, I did do a little calculation of my own a few years back, using the relative dielectric constants (RDC) of a capacitor. In a vacuum the RDC of the capacitor is given as 1. If we allow the air to immerse the capacitor in the RDC rises to 1.0006; with Teflon it is 2.1; with certain glass it is 5.0. With water it is near 80.

Now consider a capacitor with a Teflon dielectric having a RDC of 2.1 vs. the vacuum at 1.0. Knowing that the aether permeates everything on Earth, including Teflon, one should see that the 2.1 RDC of Teflon is actually the sum of a 1.1 for the Teflon (if it were possible to have Teflon without the aether) and 1.0 for the aether, which, when added together give us the 2.1 that we measure. I.e., the aether alone has about the same effect on the dielectric constant of the capacitor as the Teflon! At a minimum this belies the idea that the vacuum is without substance. What it means in the search for its energy, per cubic metre, I can’t say.

## **Solar Planetary Data & Extensions.**

Planet	Radius (cm)	Rotation Time in Seconds	Magnetic Field in Gauss	Rotation* Direction CW/CCW	Position North- Up/Dn	Electrical Current Amperes	Planetary Charge Coulombs
Earth	$6.37 \cdot 10^8$	$8.64 \cdot 10^4$	0.50	CCW	Dn	$5.07 \cdot 10^8$	$-4.38 \cdot 10^{13}$
Jupiter	$7 \cdot 10^9$	$3.57 \cdot 10^4$	4.28	CCW	Up	$4.77 \cdot 10^{10}$	$+1.7 \cdot 10^{15}$
Saturn	$5.81 \cdot 10^9$	$3.84 \cdot 10^4$	0.21	CCW	Up	$1.94 \cdot 10^9$	$+7.45 \cdot 10^{13}$
Uranus	$2.54 \cdot 10^9$	$6.21 \cdot 10^4$	0.23	CCW	Up	$9.3 \cdot 10^8$	$+5.77 \cdot 10^{13}$
Neptune	$2.46 \cdot 10^9$	$5.8 \cdot 10^4$	0.142	CCW	Up	$5.56 \cdot 10^8$	$+3.23 \cdot 10^{13}$

**Notes:** \*The Solar System is viewed from above, with directions cited accordingly.

Formulas:  $I = 10BR/2\pi$ . Gauss; Amperes; and Radius, in cm's.

$I = Q$ . (1 a./sec. = 1 Coulomb, on the bench.)

$Q = IR_t$ ; With  $R_t$  = the time of rotation of the planet in seconds.

Note that, in space, the magnetic field intensity H in oersteds is equal to the magnetic flux density B in gauss.

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