Chapter 16

The Plane of Creation

One of the most surprising cosmological findings to emerge around the turn of this century is the apparent acceleration in the rate at which the universe is expanding. This cannot be reconciled with the Big Bang theory without proposing the existence of a new and exotic form of energy. Since a primal explosion is the assumed initial cause of space expansion, the rate of expansion should either remain the same or decrease as a consequence of gravitational attraction. The only way to explain an increasing rate of expansion and save the current theory is to hypothesize the presence of some “dark energy” which opposes gravity, causing the expansion rate of space to accelerate.

This change in the rate of space expansion is detected from redshift-independent distance measurements using a specific type of supernova. These supernovae are so luminous that they are detectable all the way out to the limit of the Hubble sphere at about 14 Mly. Over 700 of these supernovae have now been detected, and more than 400 are at distances exceeding 2 Bly. Examining the distribution of these supernovae discloses that they are concentrated about a single plane. This plane is the same as the gravitational plane of the grand universe, which is the plane of creation.

Quasars, quasi-stellar objects, are the most luminous known objects. Like supernovae, they are also visible out to the limit of the Hubble sphere. There are about 150,000 of these objects in NASA’s Extragalactic Database. Quasars are extremely dense and massive objects with a minimum mass approximately equal to a trillion suns. An analysis of their distribution within the Hubble sphere discloses a preferential concentration about the plane of the grand universe. This is incompatible with the premise of a random distribution of matter on the largest cosmic scales, which is the predicted state of the universe under the Big Bang hypothesis.

According to current theory, the cosmic microwave background is the oldest possible cosmological evidence, since it was emitted about 13.6 billion years ago. At this time of last scattering there were no significant cosmic structures, just atoms evolving out of a homogeneous plasma state that filled the entire universe. Because of this origin, there should be no detectable structure in this ancient relic radiation. But a planar structure has been found in the temperature readings of the CMB over the last decade. This planarity is aligned with the plane of creation to a very high degree of statistical certainty. The planarity observed in the CMB radiation is clearly causally related to the preferential distribution of matter in the plane of creation. The CMB radiation can no longer be offered as empirical proof of a primal explosion because of this alignment. Instead, the temperature anomalies present in this radiation become evidence confirming the universality of the plane of creation.

1. Accelerating Universe Hypothesis

In 1998 Saul Perlmutter, Adam Riess, and Brian Schmidt published their very surprising findings on the apparent acceleration in the rate of space expansion. [64] The Nobel Committee awarded the 2011 Prize in Physics in recognition of this discovery. At that time cosmological theory could support either a constant rate of space expansion or a decelerating one, but not an accelerating one. Following the initial impetus of a Big Bang and an extremely short period of cosmic inflation, the rate of space expansion should slow down because of gravitational attraction. The discovery of an apparent acceleration in the rate of space expansion implies the existence of a force which is essentially anti-gravitational in nature, since it acts in opposition to gravity.

An increase in the rate of space expansion necessarily requires an expenditure of energy, but there is no known energy capable of accelerating the total mass of the universe over time. Since the premise of a Big Bang is retained, the authors found it necessary to hypothesize the existence of an entirely new form of energy – dark energy – as the cause for this apparent acceleration. About 7 billion years ago dark energy suddenly starts to manifest, causing space expansion to increase from its rate of $65\,\mathrm{kms}^{-1}/\mathrm{Mpc}$ at that time to the current rate of $73\,\mathrm{kms}^{-1}/\mathrm{Mpc}$. The quantity of dark energy required to accelerate all of the mass in the universe in this way is unimaginable. Because of this, the authors are forced to look to almost unlimited potential of vacuum energy (cosmic force) as the only possible source of this dark energy. However, no credible hypothesis was presented to explain this transformation of vacuum energy into dark energy, and none has been proposed to date.

This 1998 paper examines distances to Type Ia supernovae (SNe Ia) using the relationship between the change in their luminosity over time and their absolute magnitudes. This relationship was discovered by the astronomer Mark M. Phillips in 1993. **[65]** He found that the peak luminosity of SNe Ia declines in a predictable manner over time. The "light curve" of rising and then declining luminosity permits a calculation of the absolute magnitude of the supernova. The distance to it can then be calculated from the difference between the apparent (observed) magnitude and the absolute magnitude, which is the distance modulus ($\boldsymbol{m - M}$).

Perlmutter's team used the Phillips' relation to calculate the luminosity distances for the 50 SNe Ia identified at that time, which they then compared their distances calculated from their observed redshifts. For 34 of the supernovae the luminosity and redshift distances were in relative agreement, using the Hubble constant of $73\,\mathrm{kms^{-1}/Mpc}$. These 34 supernovae have redshifts of $z < 0.16$, which equates to a distance of less than 2.1 Bly (605 Mpc). The 14 out of 16 supernovae with $0.16 \leq z \leq 0.62$ (2-6.5 Bly) have luminosity distances that are 10-15 percent greater than their redshift distances. From this they conclude that the rate of space expansion was $65 \pm 7\,\mathrm{kms^{-1}/Mpc}$ about 7 billion years ago and that it has accelerated since to the current rate of $73\ \mathrm{kms^{-1}/Mpc}$.

The expansion rate of space (H_0) is simply the proper velocity caused by space expansion divided by the proper distance: $H_0 = v/D$. The proper velocity of an object due to space expansion can be calculated from its observed redshift (assuming no significant peculiar velocities) by rearranging the special relativity formula for calculating redshift from velocity.

$$\text{redshift from velocity:} \quad z = \sqrt{\frac{1+\frac{v}{c}}{1-\frac{v}{c}}} - 1$$

$$\text{velocity from redshift:} \quad v = \frac{(z^2 + 2z)}{(z^2 + 2z + 2)}\,c$$

Redshift distances are calculated by dividing the velocity (redshift converted to km/s) by the current value of the Hubble constant of $73\,\mathrm{kms^{-1}/Mpc}$: $D = v/H_0$. In turn, the Hubble constant can be found by dividing the proper velocity by the luminosity distance from the Phillips' relation. Within about 2 Bly the expansion rate of space calculated from the redshift velocities and luminosity distances is in relative agreement with the Hubble constant. Beyond 2 Bly luminosity distances are about 12.5 percent greater on average, which makes the expansion rate 1/1.125 less or 65 $\mathrm{kms}^{-1}/\mathrm{Mpc}$: $H_{65} = v/1.125D$.

Within the current paradigm, this can only mean that the rate of space expansion has increased by about 8 $\mathrm{kms}^{-1}/\mathrm{Mpc}$ since the light from supernovae at more than 2 Bly was emitted. The additional acceleration required to account for this increase in the rate of space expansion is about $6.9 \times 10^{-10}\ \mathrm{m/s^2}$. This is the acceleration represented by the cosmological constant, which is used in the equations developed under the theory of general relativity. Since it requires an expenditure of energy to oppose gravity and accelerate the rate of space expansion, it is necessary to hypothesize the existence of a mysterious and undetectable dark energy as the cause for this acceleration.

Under this hypothesis the rate of space expansion was decelerating immediately after the extremely short period of cosmic inflation about 14 billion years ago. The cosmic microwave background radiation has the highest theoretical redshift at $z = 1089$, since it was emitted after cosmic inflation and just a few hundred thousand years after the Big Bang. [4] Under special relativity, the recessional velocity of an object cannot exceed the velocity of light, as measured within our spacetime frame. The recessional velocity at $z = 1089$ is just 0.5 km/s less than the velocity of light under special relativity. A redshift of $z = 1089$ equates to a velocity of $0.999998c$. However, under the theory of general relativity, recessional velocities can exceed that of light. Redshifts $z > 1.46$ give superluminal velocities under general relativity. [76] Under this theory, a redshift of $z = 1089$ equates to a velocity of $\sim 3.0c$. Special relativity limits the radius of the observable universe to about 14 Bly, while some general relativistic models estimate a radius more than three times larger at 46 Bly.

There are some concerns about the applicability of the general theory on truly cosmic scales. These concerns are due to its intimate relationship with the inverse-square force of linear gravity, the observation of flat galactic rotation curves, and the discovery, beginning in 2003, that the spacetime of the universe is indistinguishable from a flat Euclidean metric. Since special relativity has been fully verified, the recessional velocities from redshift will be calculated under the special theory, as represented by the above equation.

An initial period of deceleration in space expansion lasted about 7 billion years. It has been followed by a period of acceleration in space expansion that has lasted an equal length of time. The dividing line between the deceleration and acceleration in space expansion is placed around redshift $z = 0.76$. [4] Perlmutter's team finds an estimated age for the universe of 14.2 ± 1.5 billion years.

A follow up paper was completed in 2008 by a large team led by Richard Kowalski of the University of Arizona. [66] By this time an additional 364 SNe Ia with luminosity distances were available. Out of this total of 414 supernovae, the team selected 307 supernovae with good quality luminosity distances. They use a dividing line of $z = 0.2$ to separate 57 base line supernovae with low redshifts from 250 high redshift ones at distances where accelerating space expansion is observed. This paper confirms the conclusion of the original 1998 paper with this expanded data set of 307 SNe Ia. This follow on paper and the 2011 Nobel Prize in Physics have firmly established the accelerating universe hypothesis as a standard feature of the current cosmological model.

There is a superficial resemblance between this idea of a decelerating and then accelerating rate of space expansion and the revealed concept of space respiration, but these are incompatible concepts. There is the obvious difference between cycle lengths of 14 and 2 billion years. But it is impossible under current theory for the universe to undergo a period of actual space contraction at any time between the present and the initial Big Bang some 14 billion years ago. The recent finding of an apparently accelerating rate of space expansion beginning some 7 billion years ago is irreconcilable with revealed cosmology.

The accelerating universe hypothesis has found a very wide acceptance, despite the fact that it requires the *ad hoc* premise of yet another new and very exotic form of energy to account for its dynamics. Like dark matter, dark energy is not supposed to interact through any of the fundamental forces of physics except for linear gravity. Also like dark matter, numerous speculative assumptions must be made in order to explain the dynamics.

Dark energy needs to be a rarefied and homogeneous energy pervading the whole universe. It must have an energy density of about $10^{-17}\ \mathrm{J/m^3}$ in order to make the equations of general relativity show the correct acceleration in the rate of space expansion over time. It is proposed that it originates from vacuum energy, whose energy density of $10^{113}\ \mathrm{J/m^3}$ is 120 orders of magnitude greater than that of dark energy. This unbelievably large difference in energy densities has so far made it impossible for theorists to explain how dark energy might be derived from vacuum energy. There is also no hypothesis explaining why dark energy begins to accelerate space expansion about 7 billion years ago, instead of sooner or later. There are so many blank areas and untestable assumptions in the idea of dark energy that it is difficult to consider it a workable hypothesis. It has been embraced, nevertheless, since it is the only idea which might save the standard cosmological model and all of the work that has gone into it.

It is now supposed that more than 95 percent of all energy in the universe consists of unobservable dark energy (68%) and dark matter (27%). Only 5 percent is thought to be ordinary baryonic energy-matter, the only form of energy which interacts with all four fundamental physical forces. Astrophysicists have been forced by observational facts into the rather strange position of proposing that 95 percent of everything consists of energies which do not obey the physical laws arising from three out of the four fundamental forces. In effect, they are making the radical proposal that a whole different physics applies to almost all of the energy-matter in the universe.

This radical proposal is primarily compelled by the premise of a primal explosion, which is the inferred initial cause of space expansion. A primal explosion also results in a universe that conforms to the cosmological principle, which is assumed to be true with an almost *a priori* level of certainty. If energy-matter must be distributed homogeneously and isotropically throughout the universe on the largest scales by axiomatic necessity, then the current outward expansion of space must have been caused by a primal explosion of some sort in the distant past. Whenever new data appears to challenge this principle, such as the discovery of the Sloan Great Wall, cosmologists simply increase the scale at which the cosmological principle supposedly becomes effective. There is, however, a limit to this tactical response.

The Philips' relation permits an examination of the distribution of Type Ia supernovae in the volume of the universe out to the Hubble radius. It is finally possible to empirically test the cosmological principle on the scale of the Hubble sphere. Doing so demonstrates that galaxies are not distributed randomly throughout this volume in accordance with the cosmological principle. They are distributed preferentially about a plane which is identical to the gravitational plane of the grand universe, the plane of the Local Supervoid, and the plane of the Sloan Great Wall. This preferential distribution of galaxies in the Hubble sphere fundamentally contradicts the premise of a Big Bang and the cosmological principle.

2. Type Ia Supernovae as Mass Tracers

The 1998 identification of an accelerating rate of space expansion is based upon a detectable change in the relationship between redshift and luminosity distances which occurs at about 2 Bly ($z = 0.15$). The 34 SNe Ia within this distance show an expansion rate that is comparable with the generally accepted value of the Hubble constant. The SNe Ia beyond this distance have a significantly different rate of space expansion of 65 $\text{kms}^{-1}/\text{Mpc}$. These supernovae are listed with their galactic coordinates $(\boldsymbol{l}, \boldsymbol{b})$ and measured redshifts, along with their grand universe coordinates $(\boldsymbol{\alpha}, \boldsymbol{\beta})$.

Table 11: **16 Type Ia Supernovae from 1998 Paper**

SN Ia	l	b	z	α	β
SN 1996R	259.07	54.36	0.16	279.09	1.14
SN 1997I	202.37	-26.21	0.17	185.03	-3.87
SN 1995ap	179.36	-46.15	0.23	158.17	-0.53
SN 1996T	247.59	37.00	0.24	261.54	-6.38
SN 1995ao	178.20	-50.52	0.30	154.46	-2.96
SN 1996J	253.22	34.30	0.30	262.90	-11.52
SN 1996K	224.38	20.46	0.38	236.23	0.20
SN 1996E	253.12	34.31	0.43	262.84	-11.45
SN 1996U	259.36	68.00	0.43	287.61	11.86
SN 1997ce	69.24	36.62	0.44	8.29	44.69
SN 1995K	259.95	43.33	0.48	272.86	-8.00
SN 1997cj	125.80	54.61	0.50	299.06	63.91
SN 1996I	276.85	60.01	0.57	290.21	1.16
SN 1996H	290.75	62.24	0.62	297.27	1.37
SN 1997ap	333.65	61.90	0.83	316.86	3.84
SN 1997ck	57.60	38.45	0.97	4.20	35.81

The luminosity distances of these 16 supernovae range from 2.1 to 8.6 Bly. Most of them cluster about the plane of creation. It is found that 57 percent of the objects within 5-36 Mly are located in the Superuniverse Wall, which extends about 5 degrees above the grand universe plane and 4 degrees below it. The Sloan Great Wall extends about 8 degrees above this plane and 4 degrees below it. Eighty-one percent (13/16) of these 16 supernovae are within ±12 degrees of the grand universe plane, as shown in table 11. This number of supernovae is too small to draw any conclusions, except that the distribution of these supernovae about the grand universe plane is consistent with what is seen in both the Superuniverse Wall and the Sloan Great Wall.

Type Ia supernovae occur when a white dwarf undergoes a runaway nuclear reaction ending in an explosion. The overwhelming majority of stars are destined to end their lives as white dwarfs under the theory of stellar evolution. A 2001 paper estimates that over 97 percent of all stars will eventually evolve into white dwarfs. [67] White dwarfs are faintly luminous and very dense stars. This next to last stage in the stellar life cycle begins once the fuel for nuclear fusion is exhausted, leaving a dense remnant which can radiate moderate light and heat for billions of years. The mass density of a white dwarf is roughly a million times greater than our sun's. In rare circumstances, sufficient surrounding matter is captured by the strong gravitational field of a white dwarf, and a limit to the permissible temperature and pressure within the star is approached. Where sufficient external matter is captured by a carbon-oxygen white dwarf, runaway carbon-based fusion reignites. This fusion reaction rapidly approaches the Chandrasekhar limit, and the star suddenly disintegrates in a thermonuclear event of extreme luminosity. The star is virtually annihilated, which is a defining characteristic of Type Ia supernovae. All other types of supernovae occur due to the collapse of the stellar core, which is followed by an explosion that is not thermonuclear in nature.

Supernovae occur near the end of the stellar life cycle, and they happen with predictable regularity within a sufficiently large population of stars, but they are rare events. Most white dwarfs simply cool down over a very long time and eventually become invisible black dwarfs. Since they are both regularly predictable and rare, each supernova can be associated with a stellar population, which makes them good tracers for very large aggregations of stars. According to a May 18, 2008 NASA press release (release 08-126) on a recently identified supernova, astronomers estimate that there are roughly three supernovae of all types in our Milky Way over the period of a century or one every 50 years. A 2011 study estimates the mass of our Milky Way at roughly one trillion suns, based upon findings from the advanced technique of Very Long Baseline Interferometry. [34] This gives a rate of one supernova of all types per 50 trillion suns per year.

There are two types (I & II) of supernovae. Type Ia is one of a total of seven sub-classifications. SNe Ia occur less frequently than this estimated rate of one per 50 trillion suns per year. A Type Ia occurring anywhere within the Milky Way should be visible to the naked eye for several days or months, because of its extreme luminosity. Astronomers have been watching the heavens and recording events for at least the last two millennia, which means there should a record of the SNe Ia occurring over this period. Eight references to supernovae have been found in the historical record and four have been confirmed as SNe Ia.

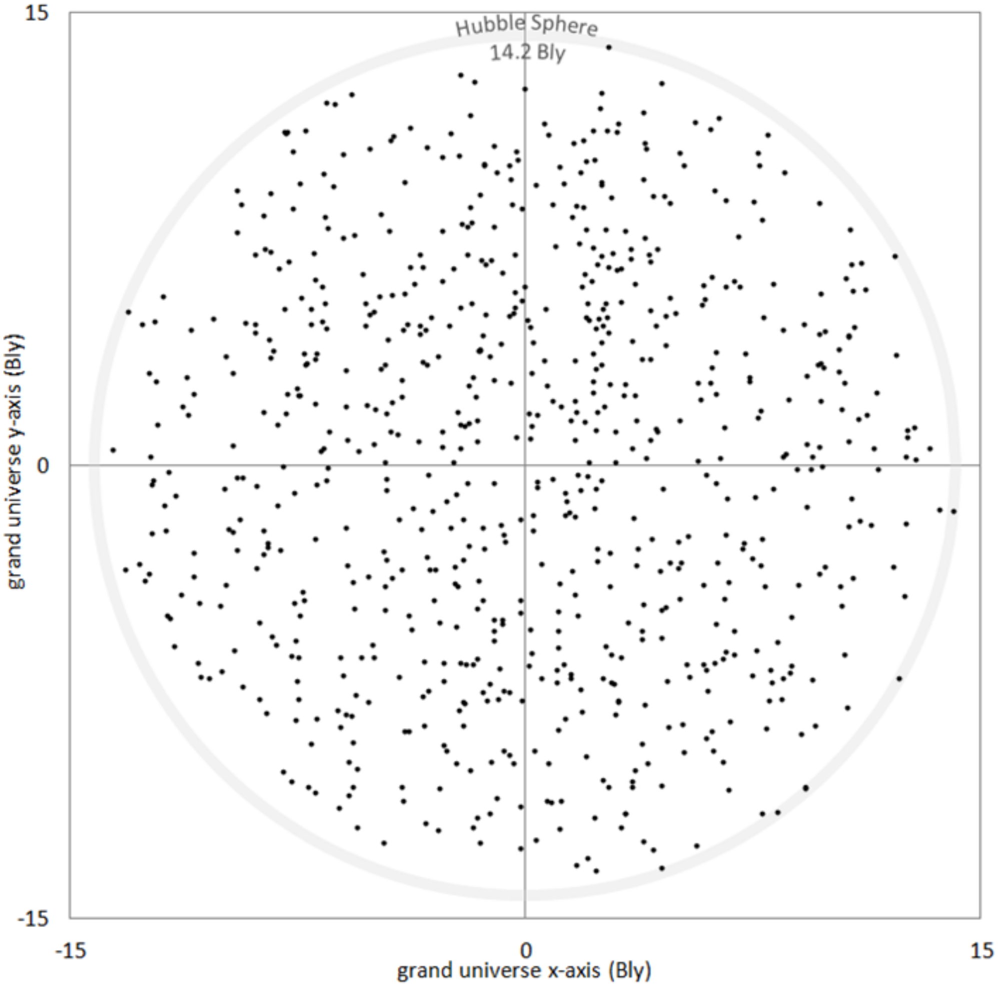
In 185 A.D. Chinese astronomers recorded a "guest star" in the direction of Alpha Centauri that was visible in the night sky for eight months. It was determined in August 2011 that this was a Type Ia (SN 185) that is about 9100 light-years from us. [68] The brightest recorded supernova occurred in 1006 in the constellation Lupus and was visible during the day for three months. This was identified as a Type Ia (SN 1006) in 1965, when its remnant was discovered 7200 light-years from us. [69] Tycho Brahe's supernova appeared in early November of 1572 in the constellation of Cassiopeia, was as luminous as Venus, and remained visible to the naked eye for more than a year. This was long assumed to be a Type Ia, but it was not until 2008 that SN 1572 was confirmed as such from its remnant located about 9000 light-years distant. [70] Kepler's supernova occurred shortly after Brahe's in 1604 in the constellation Ophiuchus and was visible during the day for more than three weeks. Kepler was able to study it for over a year. The remnant of SN 1604 was located in the 1970s about 20,000 light-years away and confirmed as a Type Ia in 2007. [71] There are four more supernovae found in the historical record. Three of them are known not to be Type Ia: SN 386 (II), SN 393 (II or Ib), and Cassiopeia A or SN 1680 (IIb). The last is SN 1181, whose remnant and type have not yet been identified.

Four confirmed Type Ia supernovae occurring in the Milky Way between 185 and 1604 is a rate of one every 473 years or about one SN Ia per year for every 473 trillion stars. This rate is probably too low. According to a 2012 news release about SNe Ia progenitors by Carlos Badenes at the University of Pittsburgh, the current estimate for the rate of these supernovae is about one per century in the Milky Way galaxy, based upon their rate of occurrence in other galaxies. [72] This is almost five times the rate found from the historical record or one SN Ia per year for every 100 trillion stars.

The rate of occurrence SNe Ia is predictable in terms of stellar populations. A rough estimate of their rate of occurrence is one per year per $10^{14}\ M_{\odot}$ (solar masses). Fortuitously, SNe Ia occur in all types of galaxies, unlike other types of supernovae, so their occurrence makes them good tracers for very large aggregations of stellar mass. It is not this simple, since the rate at which SNe Ia occur can be expected to increase over time. There should be no white dwarfs for several billion years after the Big Bang, since they occur during the final stages of the stellar life cycle. The percentage of white dwarfs in the universe should increase as stellar evolution progresses and the fuel of nuclear fusion is exhausted. Nevertheless, every SN Ia event over the course of a year is a good tracer for the existence of hundreds of trillions of stars. The distribution of SNe Ia should, therefore, correspond to the distribution of matter in the Hubble sphere.

3. Distribution of Supernovae

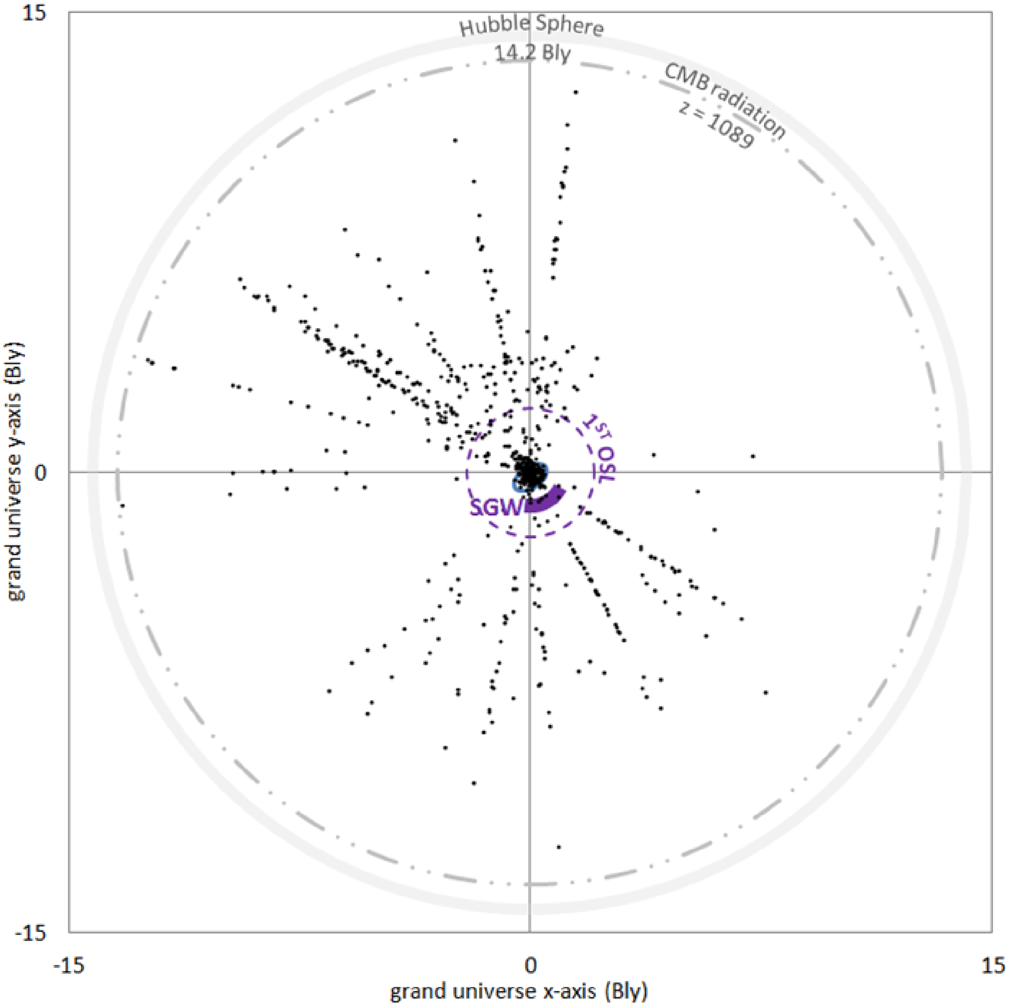
Fig 78: **745 Randomly Distributed Objects in the Hubble Sphere**



By December of 2012 there were 745 SNe Ia with luminosity distances up to 14.2 Bly in NASA's Extragalactic Database (NED). Ideally, current theory expects that these supernovae should be randomly distributed throughout the Hubble sphere, in accordance with the cosmological principle, as shown in figure 78. Practically, supernovae are not visible in about 20 percent of the volume of the Hubble sphere, due to the zone of obscuration caused by the Milky Way. Nearer supernovae are also more likely to be identified than more distant ones. Nevertheless, in those areas of the sky not obscured by the plane of the Milky Way, supernovae should be more or less randomly distributed in both direction and distance.

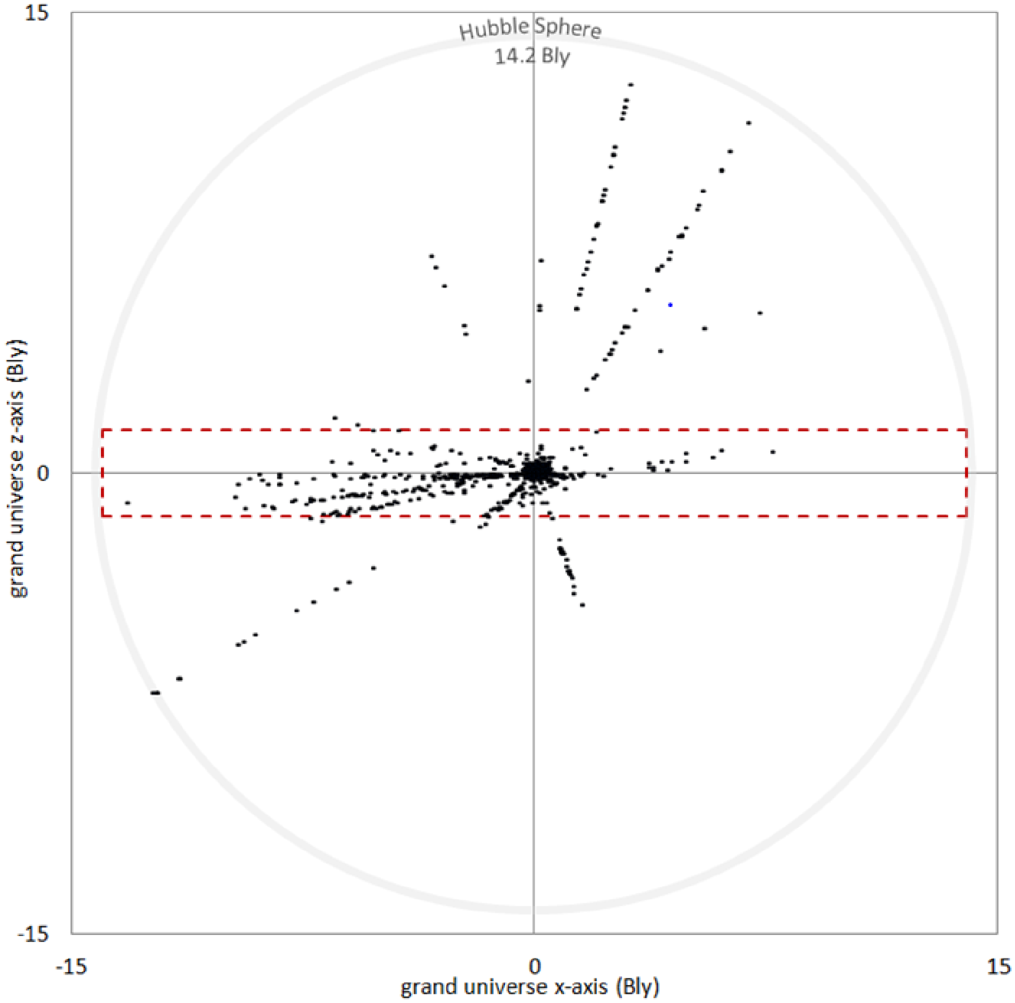
Fig 79: **745 SNe Ia within the Hubble Sphere (as of Dec. 2012)**

Looking down on the x-y plane of the grand universe



A polar plot of the 745 SNe Ia shows a more or less random distribution with the exception of regions in the upper right and lower left quadrants. The relative absence of data in these regions is partially explained by the zone of obscuration, since the plane of the Milky Way intersects the grand universe plane at $\boldsymbol{\alpha} = 32^\circ$ and $\boldsymbol{\alpha} = 212^\circ$. There is no clear pattern in supernova distribution in this polar view. A side view gives a completely different picture.

Fig 80: **638 of 745 SNe Ia (85%) within ± 1.4 Bly of Grand Universe Plane**
Looking along the y-axis at the x-z plane of the grand universe



Supernovae show a definite clustering about the plane of the grand universe. The Isle of Paradise is the universal pattern and the thickness of its elliptical disk is one-tenth of the diameter of its minor axis. One-tenth of the diameter of the Hubble sphere is 2.8 Bly. A disk 28 Bly in diameter which extends 1.4 Bly above and below the grand universe plane contains 15 percent of the Hubble volume. There are 638 supernovae within the volume of this disk, which is 85.5 percent of the 745 supernovae in the Hubble sphere. The density of supernovae within this disk is 39 times greater than it is in the remainder of the Hubble sphere. It is 5.7 times greater than the average density within the whole Hubble sphere.

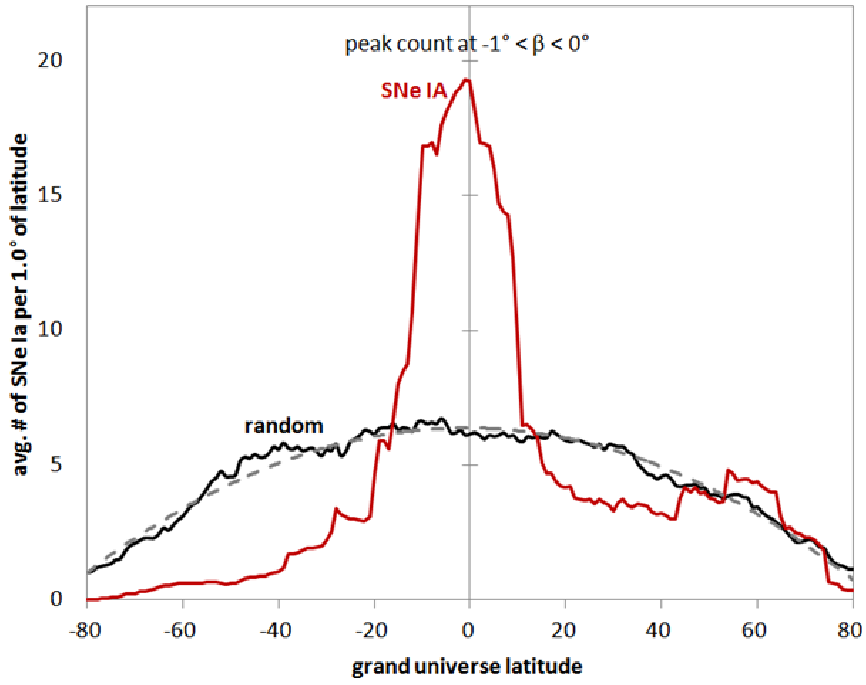


Fig 81: **Distribution of 745 SNe Ia about the Grand Universe Plane**

Counts in 1° intervals of latitude averaged over ± 10°

The apparent clustering of supernovae about the grand universe plane is confirmed by examining the number of supernovae per degree of latitude, averaged over ± 10 degrees of latitude. The count spikes at 19.3 SNe Ia per degree between grand universe latitudes $-1° < \boldsymbol{\beta} \leq 0°$. For 745 objects randomly distributed in the Hubble sphere, a peak count of 6.3 occurs at $\boldsymbol{\beta} = 0°$, which is one-third of the actual peak count. SNe Ia have a preferential distribution about the plane of the grand universe that is highly improbable for a random distribution. This finding contradicts the premise of the cosmological principle, which expects a homogeneous and isotropic distribution of matter on the largest cosmic scales.

4. Distribution of Quasi-Stellar Objects

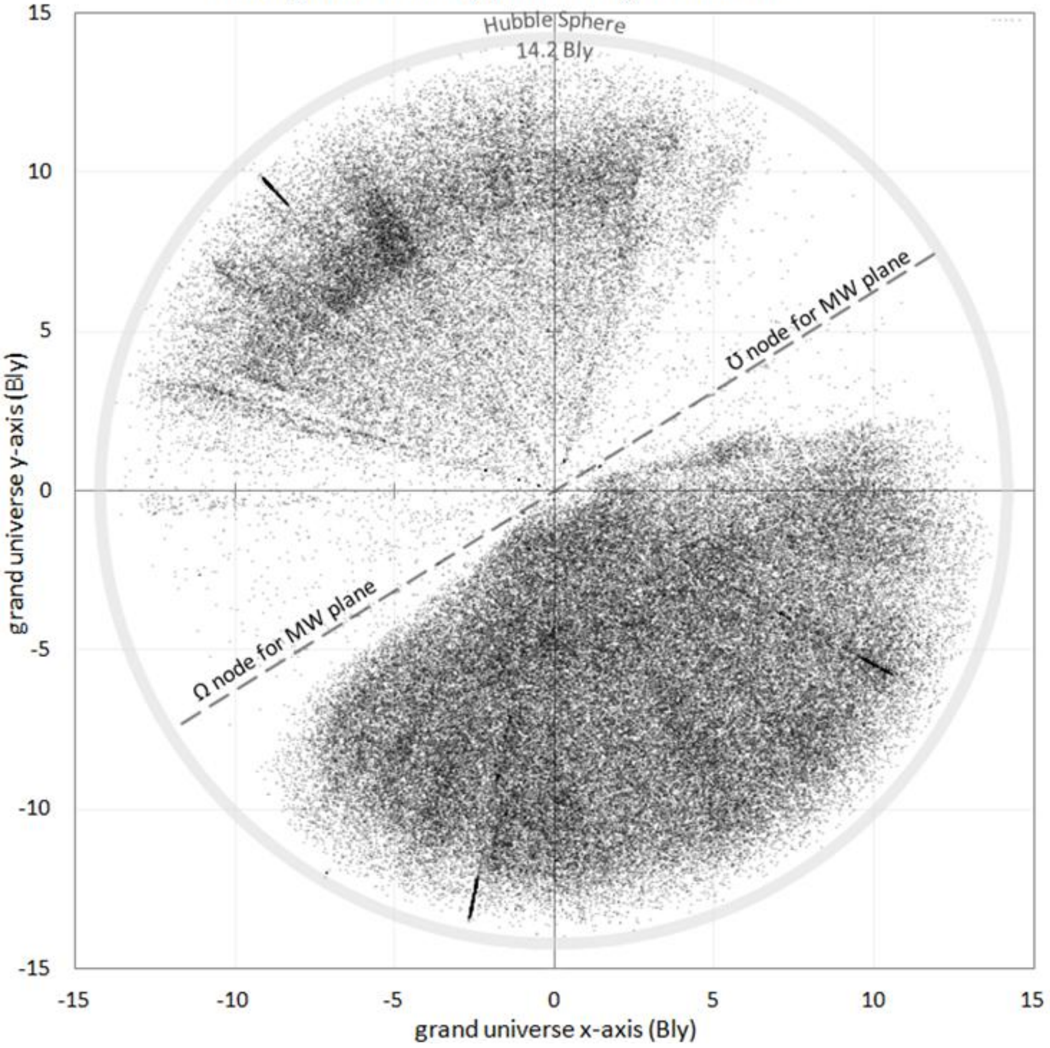
There is clearly a preferential non-random distribution of SNe Ia supernovae in the Hubble sphere about the plane of the grand universe. But there are hundreds of millions of extragalactic objects in the universe, and 745 supernovae represent an extremely small sample of this total. It is possible that this small number of objects is not particularly representative of the total and that this preferential distribution is, therefore, apparent and not real. This criticism can be addressed by analyzing the distribution of quasars, quasi-stellar objects, in the Hubble sphere.

Quasars are the most luminous objects known. An October 2013 query of NASA's Extragalactic Database returns 149,563 objects with a "QSO" morphology type. There are no quasars in the grand universe, since the nearest one is about 30 Mly distant. This is a somewhat representative sample of about 0.07 percent of the total number of ~200 million currently identified extragalactic objects. In terms of mass, these quasars constitute a more representative sample of the total ordinary (baryonic) matter in the universe. Mass in the universe is estimated at about of 75 billion Milky Way galaxies, assuming one trillion solar masses for our galaxy. Quasar emissions are thought to arise from active galactic nuclei, which are supermassive black holes at the centers of galaxies. These active galactic nuclei have masses equivalent to 1-10,000 Milky Way galaxies. At an average mass of 5,000 Milky Ways, this population of quasars is equivalent to about 733 million Milky Way galaxies, or about one percent of total ordinary (baryonic) mass in the universe.

These quasars have measured redshifts of up to $z = 7.085$. Under the theory of general relativity this redshift corresponds to a co-moving distance of 28.85 Bly or about twice the radius of the Hubble sphere. Under the theory of special relativity this redshift gives a proper distance of 14.15 Bly. This distance uses the formula given in section 1 to calculate proper velocity from redshift and the recent Planck Mission value for the Hubble constant of $67\,\mathrm{kms}^{-1}/\mathrm{Mpc}$. Proper distances for these 149,563 quasars are calculated in the context of special relativity. In terms of examining how their distribution within the observable universe varies from a random one, it does not matter which method is used to calculate their distances.

A polar plot of these QSOs (figure 82) shows a more or less random distribution with the exception of regions in the upper right and lower left quadrants, where extragalactic objects are somewhat obscured by the plane of the Milky Way. The nodal line where the Milky Way and grand universe planes intersect is shown.

Fig 82: **149,536 QSOs within the Hubble Sphere (as of Oct. 2013)**
Looking down on the x-y plane of the grand universe



However, a side view of these QSOs shows their preferential concentration about the plane of the grand universe. A disk 28 Bly in diameter which extends 0.71 Bly above and below the grand universe plane contains 7.5 percent of the Hubble volume. There are 36,887 QSOs contained within the volume of this disk, which is 25 percent of all QSOs in the Hubble sphere. The density of QSOs within this disk is 4.0 times greater than it is in the remainder of the Hubble sphere. It is 3.3 times greater than the average density within the whole Hubble sphere.

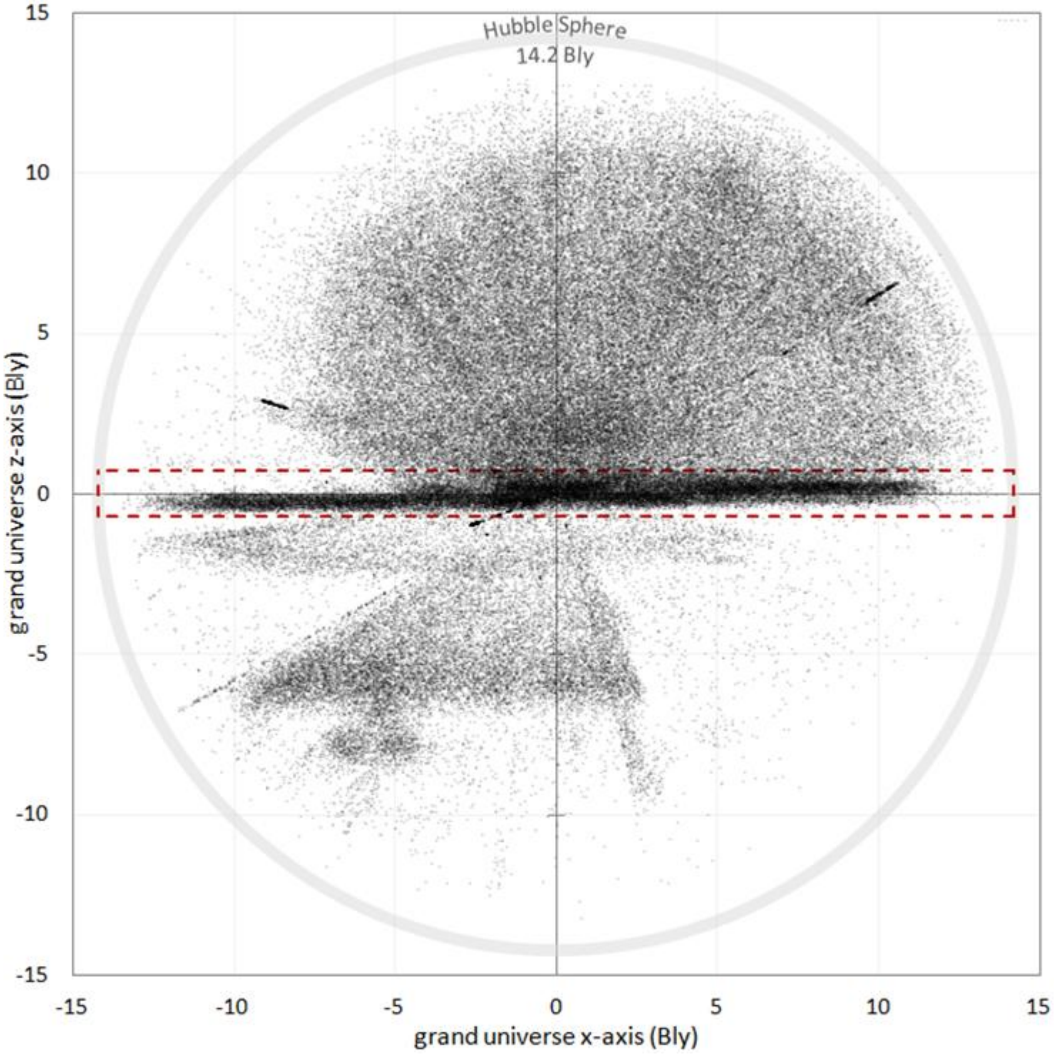


Fig 83: **25% of 149,536 QSOs within ± 0.71 Bly of the Grand Universe Plane**
Looking along the y-axis at the x-z plane of the grand universe

The apparent clustering of QSOs about the grand universe plane is confirmed by counting the number of these objects per 0.1 degree of latitude, averaged over ± 1 degree of latitude. The count spikes at 697 QSOs per 0.1° at grand universe latitude $-1.1° < \boldsymbol{\beta} \leq 1.0°$. For 149,563 objects randomly distributed in the Hubble sphere, a peak count of 137 occurs at $\boldsymbol{\beta} = 0°$. This peak count for a random distribution is one-fifth of the actual peak count. As a matter of probability, it is virtually impossible for this many QSOs to cluster in this way about a single plane, if they were in fact randomly distributed on the largest cosmic scales.

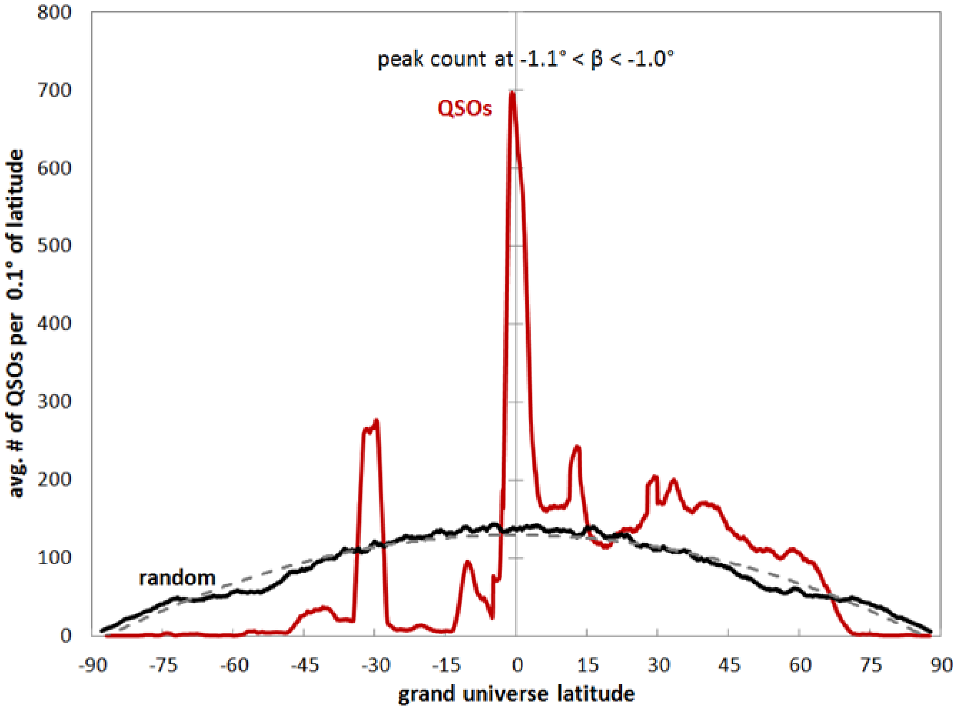


Fig 84: **Distribution of 149,563 QSOs about the Grand Universe Plane**

Counts in intervals of 0.1° averaged over ±1°

This empirical finding effectively disproves the premise that mass is distributed homogeneously and isotropically on the largest cosmic scales. The Big Bang theory requires such a random distribution of galaxies in the Hubble sphere as a whole. The improbability of a preferential distribution of both supernovae and quasars about the plane of the grand universe fundamentally contradicts this theory.

5. Planarity of the CMB Radiation

The theory of a Big Bang should result in a random distribution of matter in the universe on the largest scales. This is directly contradicted by the preferential distribution of both SNe Ia and quasars about the plane of the grand universe. However, about 20 percent of the celestial sphere is obscured by the plane of the Milky Way and cannot be surveyed in the visible portion of the spectrum. The Sloan Digital Sky Survey (SDSS), the most comprehensive to date, has mapped about 35 percent of the celestial sphere. In terms of the grand universe (and also the equatorial) coordinate system, SDSS is mostly limited to the northern hemisphere and conducted little or no surveying above latitude $\boldsymbol{\beta} = +70°$. The 2-degree Field Galaxy Redshift Survey (2dFGRS) examined about 4 percent of the celestial sphere, was limited to the southern hemisphere, and did not survey below latitude $\boldsymbol{\beta} = -75°$. Systematic surveys cover perhaps half of the celestial sphere. The data contained in NASA's Extragalactic Database (NED) is representative of the contents within the Hubble sphere, but it is not complete.

Unlike the astronomic data contained in NED, the data on CMB temperatures can be considered both comprehensive and complete. A significant portion of the celestial sphere has not yet been systematically surveyed for unique objects, but CMB temperatures have been accurately measured across the entire celestial sphere. Despite the empirical evidence from unique object data which contradicts the Big Bang theory, this hypothesis has always been most strongly confirmed by the observed isotropy of the CMB radiation. It is reasonable to take the position that the complete set of data on the CMB radiation constitutes stronger empirical evidence of a primal explosion than any apparent preferential distribution of energy-mass in the incomplete set of unique extragalactic objects.

If there was an initial explosion followed by an extremely short period of cosmic inflation, there must have been a time of last scattering about 380,000 years after the Big Bang. At this time photons were no longer blocked by the homogeneous hot plasma filling the entire universe. Following the Big Bang, this plasma had cooled down to about $3000\,°\boldsymbol{K}$, and individual atoms were beginning to form out of it. The opaqueness of the plasma gave way to the transparency of atoms, and the electromagnetic radiation of the CMB was emitted with a uniform temperature. Over the 13.6 billion years since this time of last scattering, the temperature of this radiation has dropped to $2.73\,°\boldsymbol{K}$, due to space expansion. Theoretically, this CMB radiation is the oldest of all possibly observable things, since it was emitted at the farthest possible distance.

Emissions from quasars and Type Ia supernovae are much younger. Under the calculations of general relativity, the most distant quasars are about 28 Bly distant, while the radius of the universe is about 46 Bly. About 80 percent of the volume of the universe lies beyond the most distant quasars. The much greater age and completeness of the CMB data gives it a higher level of credibility, making it more persuasive.

The persuasiveness with which the CMB supports current theory depends upon the degree of uniformity in its temperature. If the CMB radiation was all emitted at about the same time more than 13 billion years ago, then the temperature observed today should be highly isotropic. NASA's Wilkinson Microwave Anisotropy Probe (WMAP) was launched in 2001 to test this hypothesis among others. The project released its first set of observations two years later. The probe measured CMB temperatures at a resolution of 13 arcminutes (about 1/5th of a degree) across the whole celestial sphere. These primary temperature readings are highly isotropic across the whole sky, once foreground contamination is removed, and are uniform to the degree predicted by the theory. However, a more detailed analysis of this temperature data discloses the presence of some minor but systematic and troubling anisotropies in the data.

The mathematics of spherical harmonics is a primary tool for analyzing the millions of discrete CMB temperature observations on larger angular scales. This technique permits the aggregate analysis of observations in terms of spherical areas subtending varying degrees of arc. The largest angular separation ($\ell = 1$) between spherical surfaces is 180°. On this scale the WMAP data shows temperature extremes existing at the centers of two hemispheres. There is a dipole where the temperature varies from a maximum of 2.732° K at the center of one hemisphere to a minimum of 2.724° K at the center of the other. Spherical harmonics allows the direction to the (warm) dipole to be identified with good accuracy and has been found to be at longitude $\boldsymbol{l} = 264.14°$ and latitude $\boldsymbol{b} = 48.26°$ in galactic coordinates. [6] This anisotropy in the CMB temperature can be explained by assuming that the sun is moving at 371 km/s relative to the CMB in the direction of the (warm) dipole. Since the peculiar velocity of the sun relative to the CMB causes this temperature dipole, it is an apparent and not a real deviation from the high degrees of isotropy in the CMB temperature predicted by the Big Bang theory.

If the data is analyzed in quadrupoles ($\ell = 2$), the normals to the centers of four areas on the sphere reveal two poles in addition to the dipoles for a total of four.

When analyzed as octopoles ($\ell = 3$), which examine arc sections of about 60 degree on the celestial sphere, an inexplicably systematic pattern appears.

Fig 85: **CMB Dipoles, Quadrupoles, Octopoles and the Ecliptic Plane**

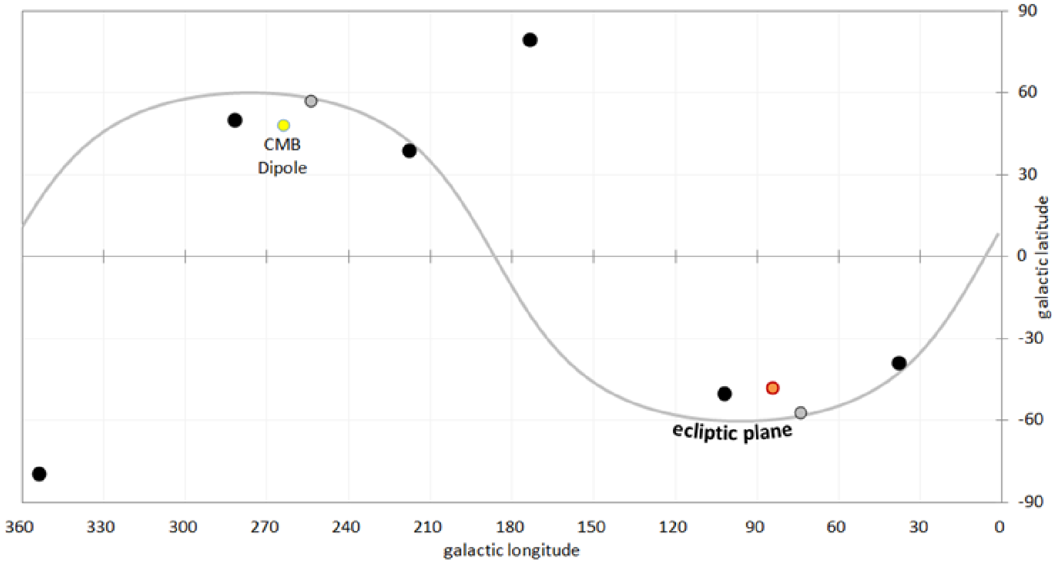


Table 12: **CMB Multipoles** [73]

	l	*b*
Dipole (yellow) ($\ell = 1$)	264	48
Dipole (orange) ($\ell = 1$)	84	-48
Quadrupole (gray) ($\ell = 2$)	254	57
Octopole (black) ($\ell = 3$)	282	50
Octopole (black) ($\ell = 3$)	218	39
Octopole (black) ($\ell = 3$)	174	80
Quadrupole (gray) ($\ell = 2$)	74	-57
Octopole (black) ($\ell = 3$)	102	-50
Octopole (black) ($\ell = 3$)	38	-39
Octopole (black) ($\ell = 3$)	354	-80

A 2004 paper by Dominik J. Schwarz at the European Organization for Nuclear Research (CERN) [73] found that the dipoles, quadrupoles, and octopoles are unexpectedly aligned with each other and with the great circle of the ecliptic plane. These CMB multipoles are not far removed from the plane in which the planets of our solar system orbit the sun. He found that a chance alignment of these multipoles with the ecliptic plane is statistically excluded at more than the 99 percent confidence level. There is less than one chance in a hundred that the

CMB radiation is uniform in temperature when examined on these large angular scales. Plotting these multipoles in galactic coordinates reveals this overall pattern on the celestial sphere.

This finding strongly disagrees with the assumption of a highly isotropic CMB temperature arising from a highly uniform distribution of matter throughout the universe, following the period of cosmic inflation. In a 2005 paper by Kate Land, facetiously entitled "The Axis of Evil," she found that this alignment of the multipoles excludes the possibility of a highly uniform CMB temperature across the celestial sphere at more than the 99.9% confidence level. [74] There is less than one chance in a thousand that this is a chance alignment or that it is consistent with the degree of isotropy required by theory. If there is a preferred direction in the CMB as indicated by this finding, Land remarks that this will have "potentially very damaging implications for the standard model of cosmology." A 2010 paper by Craig Copi finds a similar degree of improbability for this alignment with the ecliptic plane. Copi concludes that such alignments "provide a strong indication that the full sky CMB WMAP maps are inconsistent with the standard cosmological model at large angles." [79]

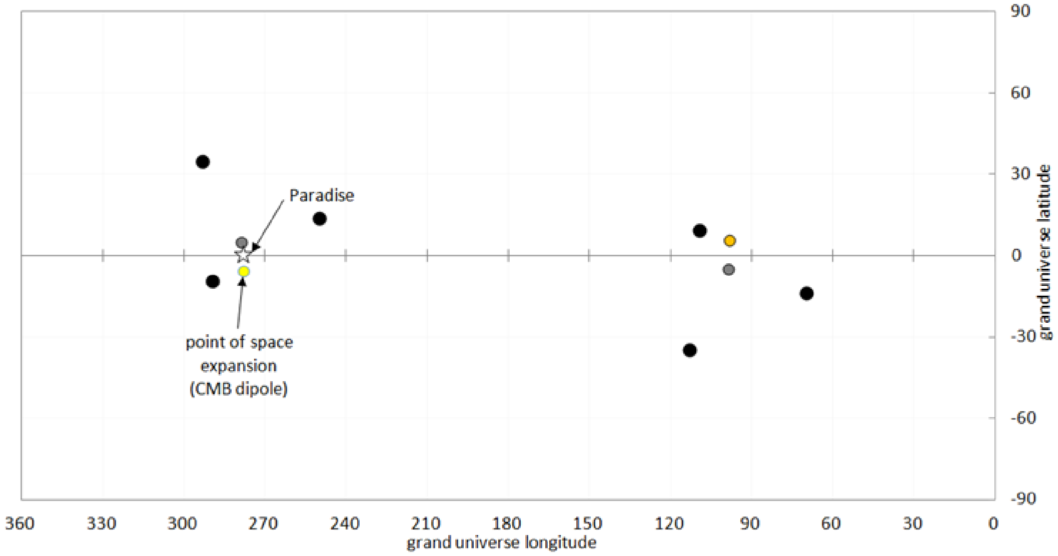
These and other studies conclude that it is extremely improbable that the CMB temperature is uniform to the degree required by the Big Bang theory and cosmic inflation. According to the astrophysicist Lee Smolin, the presence of this apparent structure in the CMB radiation is very troubling to most cosmologists. "The radiation in these large scale modes is not symmetric; there is a preferred direction … These observations are controversial because they disagree profoundly with what we would expect on the basis of inflation." [75] The presence of this structure in the CMB is disturbing because it is profoundly incompatible with the premises of a primal explosion, cosmic inflation, the supposed origin of the CMB radiation, and the cosmological principle.

Cosmologists have tended to assume that this planarity in the CMB data is most likely due to a limitation in the accuracy of WMAP measurements. This assumption is no longer tenable following the publication of the Planck Mission results by the European Space Agency in March 2013. [96] The instrumentation on the Planck satellite is three times more sensitive and accurate than WMAP's. The multipole temperature anomalies first found by WMAP have been examined and fully confirmed to exist by the Planck Mission. There is no longer any doubt that these multipoles are present in the data, but they remain unresolved anomalies, since "a satisfactory explanation based on physically motivated models is still lacking." [96] There is still no credible explanation for the planarity of these temperature differentials in the cosmic microwave background.

A very high level of statistical correlation implies but does not prove causation. There is no credible causal relationship between the ecliptic plane of the solar system and these CMB multipoles. The cause of this alignment of the multipoles with this plane is inexplicable, but it is generally assumed that it must be related to some as yet unexamined feature or aspect of the current cosmological paradigm, which has not yet been identified. After all of the apparent successes of the standard model, this is almost universally accepted as the only reasonable assumption. This premise is challenged, however, by a previously unrecognized fact. The CMB multipoles are aligned with the plane of the grand universe to at least the same level of improbability as the ecliptic plane.

The ecliptic plane has essentially the same degree of tilt to the galactic plane as does the equatorial plane of the earth. The earth's equatorial plane is tilted less than two degrees to the gravitational plane of the grand universe, which is the plane of creation. This plane of creation is confirmed to exist by the preferential distribution of matter in the superuniverse and first outer space levels and the distribution of SNe Ia and quasars beyond the first outer space level. The very high degree of correlation between the CMB multipoles and the plane of creation strongly implies a causal relationship between the two. Plotting these multipoles in grand universe coordinates reveals their striking symmetry and alignment with the plane of creation.

Fig 86: **Alignment of the CMB Multipoles with the Plane of Creation**



The CMB multipoles show at least as high a degree of non-random alignment with the grand universe plane as they do with the ecliptic plane. The plane of creation also passes almost exactly between the four quadrupoles, two of which are the dipoles. The two dipole-quadrupole pairs are also at almost exactly the same longitude, so that a line connecting the members of each pair is only ±0.2 degrees from a perpendicular drawn to the equatorial plane. The same symmetry is found between two pairs of the eight octopoles. Lines connecting the members of the two pairs at longitudes ~110° and ~290° are just ±1.8 degrees from a perpendicular to the plane. The plane of creation passes between the quadrupoles. Four of the five pairs of multipoles are arranged perpendicularly to the plane of creation. These symmetries add two new orders of improbability to the already highly improbable alignment of the multipoles with this plane. The perpendicular orientation of four-fifths of the multipole pairs very strongly implies a causal relationship between them and the plane of creation.

If the CMB was relic radiation from a time when matter was changing from a homogeneous plasma state into individual atoms, there should not be any systematic anisotropy in the temperature data. The existence of the CMB multipoles and their alignment with a plane directly contradicts the hypothesis that the CMB radiation was emitted 13.6 billion years ago. This radiation was not emitted when matter was distributed the universe in a highly homogeneous and isotropic manner. Since this is not the origin of the CMB radiation, it is no longer empirical evidence supporting a previous Big Bang event. Without this support and in light of the preferential distribution of galaxies in the universe about a universal plane, the Big Bang hypothesis is no longer the most credible cosmological theory.

6. The Universal Material Plane

The extremely high correlation of the CMB multipoles with the plane of creation clearly indicates the two are causally connected. There is a well-known causal relationship between the CMB radiation and the Milky Way which has the potential to explain the presence of these multipoles.

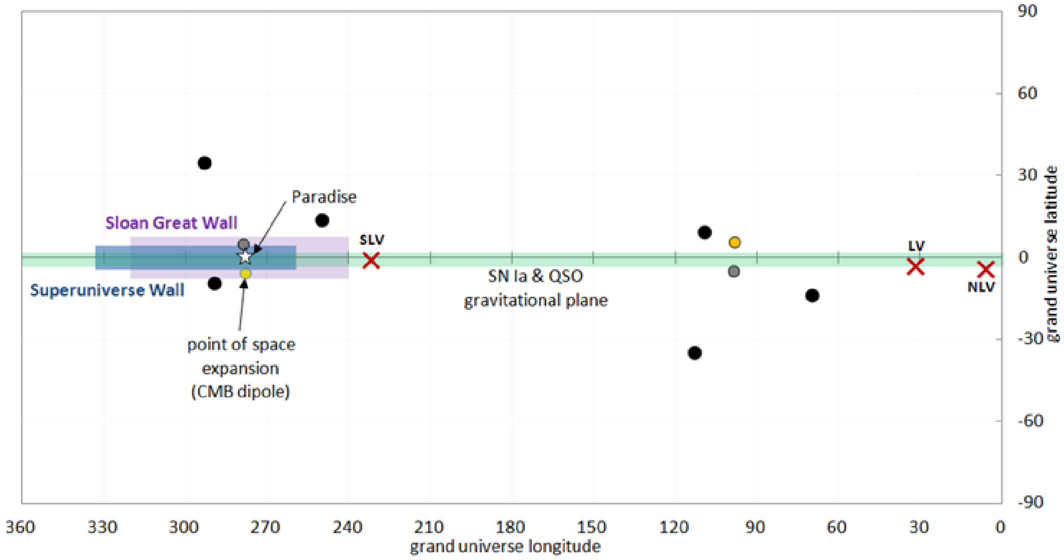
The unprocessed measurements of the CMB radiation do not show a highly uniform temperature. This microwave background radiation originates at some large distance from us. Over about 20 percent of the sky this radiation must pass through the relatively dense plane of the Milky Way to reach us. Due to various physical processes, matter in the Milky Way plane emits microwaves of the same general frequency as the CMB. A map of this foreground radiation plus the cosmic microwave background radiation does not show a highly uniform temperature across the celestial sphere. The effects of the rotation of the galactic plane upon temperature readings are clearly evident in this data. [6] Removing the foreground radiation caused by Milky Way microwave emissions and galactic rotation from the raw temperature data is required to show a cosmic microwave background radiation with a highly uniform temperature.

About half of all matter within 36 Mly is concentrated in the plane of the grand universe. The galaxies in the plane of the superuniverse space level are emitting microwaves in the same frequency range as the CMB for the same reasons that the Milky Way galaxy does. This plane is also in gravitational rotation just like the plane of the Milky Way. This necessarily generates a foreground radiation which overlays and is added to the CMB radiation, which is then no longer highly uniform in temperature. The deviation from temperature uniformity will be relative to and aligned with the plane of the grand universe, just as the foreground emissions of the Milky Way are aligned with its plane. This foreground radiation from superuniverse microwave emissions and rotation can theoretically account for the appearance of the CMB multipoles and their alignment with the gravitational plane of the grand universe.

Disregarding the origin of the CMB radiation for the moment and assuming that it is highly uniform in temperature, there is a credible explanation for the CMB multipoles based upon the confirmed existence of the superuniverse space level and its rotation. This explanation also applies to the preferential concentration of mass about the plane of creation apparent in the first outer space level and beyond. Given this distribution of mass in the universe, CMB temperature measurements would have to be altered by the foreground emissions from the galaxies in this plane, as well as the gravitational revolution of matter about the center of the universe.

This is a credible explanation for the CMB multipoles based upon known physical relationships, but it depends upon the preferential distribution of matter in a universal plane. The dramatic increase in the quantity of extragalactic data over the last decade confirms the existence of this universal material plane on all cosmic scales.

Fig 87: **Alignment of Cosmic Structures with the Universal Material Plane**



The Superuniverse Wall defines the gravitational plane of the grand universe, and the superuniverse space level is about 30 Mly in diameter. The Local Supervoid is a much larger cosmic structure with a diameter of about 1 Bly. It is constituted of three local voids, whose centers define a plane that is close to that of the grand universe. The Sloan Great Wall defines the gravitational plane of the first outer space level, which is exactly the same as that of the grand universe. The first outer space level has a diameter of perhaps 4 Bly. Within and beyond the first outer space level, extending out to the limit of the Hubble sphere, the distribution of supernovae and quasars define a gravitational plane in which galaxies are preferentially concentrated. This plane is within one degree of the plane of the grand universe. Since quasars are the most distant observable objects in the universe, this material plane is extends all the way out to the observable limits of the universe.

The empirical data firmly establishes the existence of a universal material plane on all cosmic scales from the smallest to the largest. This preferential distribution of galaxies in the universe potentially explains the appearance of the CMB multipoles, which otherwise remain inexplicable anomalies. The statistically extreme confidence level at which the CMB multipoles are aligned with this plane and the major cosmic structures on it leads to the clear inference that the two are causally related. Such a universal cosmic structure is impossible under the Big Bang hypothesis, which requires a homogenous and isotropic distribution of matter on the largest cosmic scales. Since this hypothesis is disproven by the empirical data demonstrating the actual distribution of matter in the universe, the CMB radiation could not have arisen as an evolutionary consequence of a primal explosion. This radiation is not evidence of the Big Bang. The multipole temperature anomalies in the CMB are evidence of the existence of a universal material plane.

The preferential distribution of matter in a universal plane is determined from the accurate longitudes and latitudes for hundreds of thousands of extragalactic objects. This finding does not really depend upon having accurate distances to these objects. Their preferential distribution about a great circle on the surface of the celestial sphere at densities much higher that what a random distribution can explain is sufficient to establish the existence of this plane. These locations are a primary form of data that is not processed or interpreted. Although it is possible that an examination of the distribution of the ~200 million currently identified extragalactic objects on the celestial sphere might show something different from this planarity, this is highly improbable. The hundreds of thousands of objects already examined cover about half the celestial sphere and constitute a representative sample of all galaxies at all distances within the Hubble sphere, based upon their redshifts.

The available evidence refutes the hypothesis of a Big Bang. Therefore, the CMB radiation did not arise a few hundred thousand years following such an event. Nevertheless, this radiation is present and does appear to be highly uniform. This uniform temperature is measured in every direction and is just a little above absolute zero at 2.73 °$\boldsymbol{K}$**.** This radiation is not the evolutionary relic of a prior Big Bang. Revelation explains the origin of this universal phenomenon in terms of the presence of gravity.

> Throughout all organized space there are gravity-responding energy currents, power circuits, and ultimatonic activities, as well as organizing electronic energies … Gravity presence and action is what prevents the appearance of the theoretical absolute zero, for interstellar space does not have the temperature of absolute zero. **42:4.6**

Gravity is universally present and effects “energy currents, power circuits, and ultimatonic activities, as well as organizing electronic energies.” This gravity action causes the emission of radiant energy which is detected as the uniform cosmic microwave background coming at us from every direction. The observational data on CMB temperatures, which once appeared to support the Big Bang hypothesis, now becomes evidence supporting the existence of the universal material plane.

The simplest and most logical explanation for the existence of a material plane of creation is the universal revolution of galaxies due to gravity. It is impossible for the linear gravity of Newton and Einstein to hold all of creation in gravitational revolution. Revelation describes a new type of central force – absolute gravity – which is capable of doing so. It revealed description matches the only other type of central force theoretically able to hold satellites in stable orbits; a directly proportional central force. The existence of a single gravitational plane requires a single center of universal revolution – the Isle of Paradise. The existence of a universal center of gravity and revolution eliminates the possibility that the universe began with the primal explosion of a gravitational singularity. The phenomenon of space expansion is observable, but it cannot be explained by the impetus imparted by a primal explosion, since there never was a Big Bang. There must be some other cause for space expansion – such as space respiration.

There is no longer any scientific basis for placing an age limit on the universe. A period of revolution about Paradise of 87 billion years is entirely reasonable from a scientific perspective. The Andronover nebula began to form 875 billion years ago and is the 876,926th nebula initiated by the Master Force Organizers. This is no longer an insupportably long time. The revolution of galaxies in the space levels around Paradise may have been going on for many trillions of years. The evolution of baryonic energy-matter from space potency and cosmic force has been going on for longer still. In current theory the universe is tightly constrained by a relatively fixed period of existence. In revealed cosmology the age of the universe expands profoundly. The enormity of the dimension of time overwhelms the finite domain of space, reaching unimaginably far back into the mystery of the eternal past.