

Chapter 9

The Grand Universe

The galaxies of the grand universe cluster about the plane of material creation, which increases in height and depth as the distance from Paradise increases. They have the appearance of a V-shaped structure when viewed in cross-section. The superuniverse space level is divided into seven equal space segments, which establishes proportional relationships between the size of the grand universe and the dimensions of each superuniverse. The locations of the seven superuniverses relative to Paradise North are given, and a chart of the internal structure of the grand universe can be drawn. Our superuniverse of Orvonton has a southeast compass bearing from Paradise North, as defined by the circulation of cosmic force through the inner zone of nether Paradise.

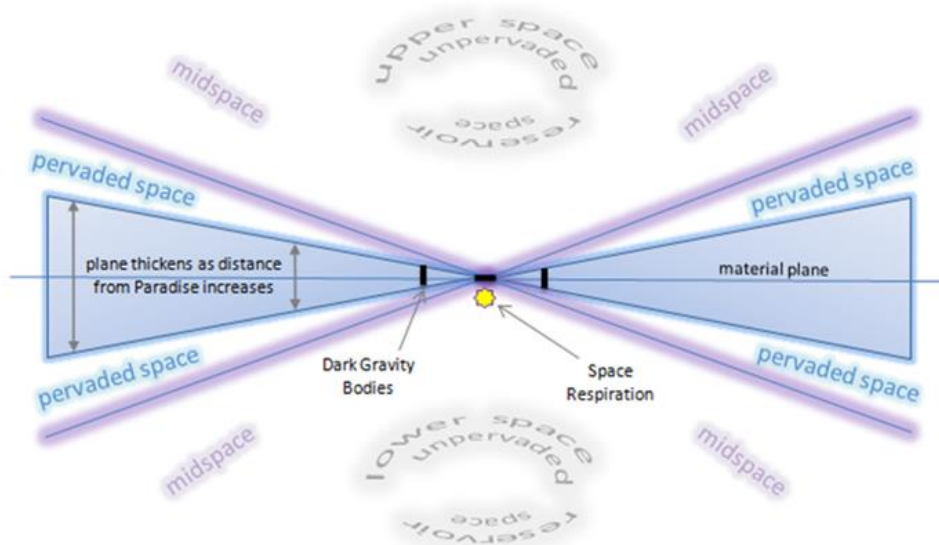
Uversa is the headquarters world of Orvonton and is between 200,000 and 250,000 light-years away. It is concealed behind the stars and interstellar dust in the plane of the Milky Way. There are potentially 10 trillion suns in Orvonton which are segregated in ten major sectors or star drifts. At the time *The Urantia Book* was indited, eight of these ten major sectors had been identified by Edwin Hubble in his 1936 work, *The Realm of the Nebulae*. Hubble called these eight nebulae the Local Group.

The Milky Way and Andromeda galaxies are part of the Local Group and each contains about one trillion solar masses. Recent studies estimate the mass of the Local Group at roughly 5 trillion solar masses, which is 65 percent of the eight trillion observable suns in Orvonton. The members of the Local Group are gravitationally bound together, and Orvonton is a gravitationally bound structure which revolves about Uversa. The superuniverse of Orvonton can be positively identified as the Local Group. The radius of Orvonton is between 3.4 and 4.4 million light-years. The distance to the Isle of Paradise is between 7.9 and 10.2 million light-years, based upon the internal structure of the grand universe.

1. Revealed Internal Structure

The Perfector of Wisdom describes a cross-section of the master universe as having a V-shape. He tells us that pervaded “space thickens, and it thickens somewhat faster than does the plane of creation, the universes.” 11:7.6 The grand universe is at the center of the master universe, so this description applies to the grand universe as well. The greater the radial distance from Paradise, the greater is the vertical distance from the gravitational plane to the upper and lower boundaries of pervaded space. The boundaries of pervaded space separate more rapidly than do the upper and lower boundaries of the plane of material creation. A cross-section of the galaxies of the grand universe forms an acute V-shape. The superuniverse space level is what we can see of the grand universe, since the central universe is enshrouded by the wall of dark gravity bodies.

Fig. 19: The Material Plane of the Superuniverse Space Level in Cross-Section



“The Seven Superuniverses are not primary physical organizations Each superuniverse is simply a geographic space clustering of approximately one seventh of the organized and partially inhabited post-Havona creation, and each is about equal in the number of local universes embraced and in the space encompassed.” 12:1.12 A superuniverse is not a “primary physical organization,” from which we can infer that it does not have the appearance of a nebula or

galaxy, which are primary physical organizations. This implies that the distribution of galaxies throughout the superuniverse space level is not heavily concentrated in seven isolated locations, as they would be if each superuniverse had the form of a galaxy like the Milky Way. Each superuniverse is more accurately thought of as one seventh of the volume encompassed by the torus-shaped superuniverse space level.

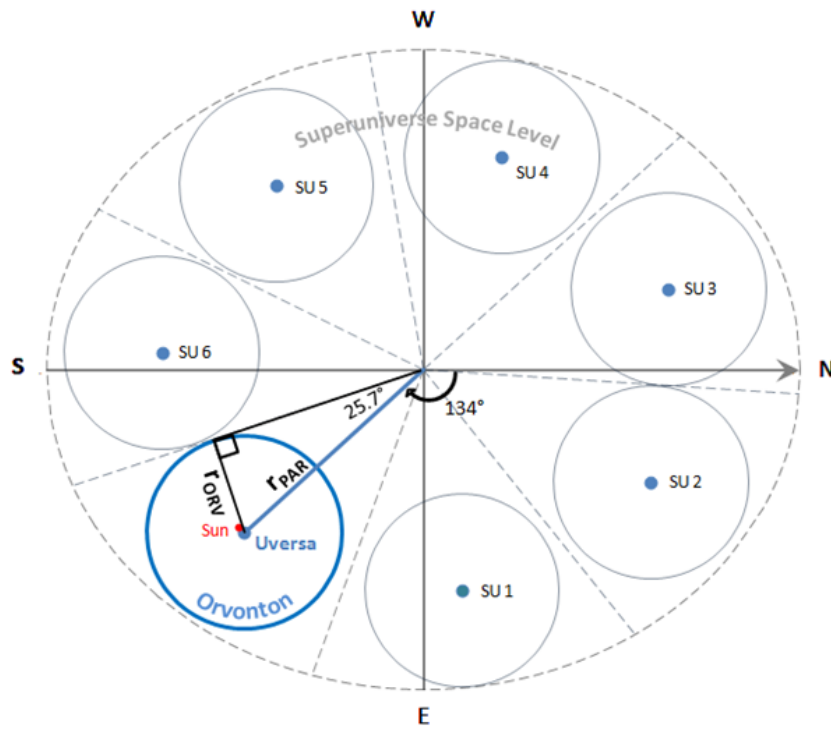
This segmental concept of the superuniverse space level is reinforced by the Universal Censor: "The Seven Master Spirits radiate their influence out from the central Isle, thus constituting the vast creation one gigantic wheel, the hub being the eternal Isle of Paradise, the seven spokes the radiations of the Seven Master Spirits, the rim the outer regions of the grand universe." 15:0.1 "Early in the materialization of the universal creation the sevenfold scheme of the superuniverse organization and government was formulated. The first post-Havona creation was divided into seven stupendous segments, and the headquarters worlds of these superuniverse governments were designed and constructed." 15:0.2 Chronologically, the superuniverse space level is created, divided into seven stupendous and equal space segments under the influence of their respective Master Spirits, and then the headquarters world of each superuniverse is constructed. Subsequent to this, the galaxies of each superuniverse are created by the action of the Paradise Force Organizers and are held in orbit about each superuniverse capital by linear gravity.

The specific orientations of the superuniverses relative to Paradise North are provided. Uversa has already turned the southeastern bend and Urantia is just now at this turning point. This puts Uversa ahead of us in the counterclockwise revolution of the superuniverse space level about Paradise. "Orvonton, the seventh superuniverse, which swings on between superuniverses one and six, having not long since (as we reckon time) turned the southeastern bend of the superuniverse space level. Today, the solar system to which Urantia belongs is a few billion years past the swing around the southern curvature so that you are just now advancing beyond the southeastern bend..." 15:1.5

The southeastern direction – a compass bearing of 135 degrees – is relative to Paradise North and compass bearings are measured clockwise from due north. (Unlike longitude which is measured in the counterclockwise direction.) Urantia is just now at about 135 degrees, the southeastern bend. Uversa is slightly ahead of Urantia in counterclockwise rotation, since it turned this bend some time ago. Uversa is only about 200,000 light-years away, and Orvonton is a few million light-years in radius, so Paradise must be several million light-years away. The difference in compass bearing between Uversa and Urantia is perhaps one

degree, which would put Uversa at a compass bearing of ~ 134 degrees. If the southeastern bend is a region instead of a location, then “advancing beyond the southeastern bend” would imply a location further along the superuniverse orbit with a compass bearing for Uversa that is less than 134 degrees.

Fig. 20: Revealed Internal Structure of the Grand Universe



The grand universe consists of the Havona space level which is surrounded by the superuniverse space level. The superuniverse space level is divided into seven pie-shaped sectors of equal size. Dividing the grand universe into seven equal segments subtending 51.4 degrees each gives the structure in figure 20. This revealed inner structure, in conjunction with the radius of Orvonton, can be used to calculate the proportional distance between Uversa, the headquarters of Orvonton, and the Isle of Paradise.

Since each sector is one seventh of the grand universe, each superuniverse spans an arc of 51.4 degrees, as measured from Paradise. Fitting Orvonton into its V-shaped sector, its circumference will be tangent to the sides of its V-shaped space sector at two points. The point(s) at which the sector line from Paradise is tangent to the circumference is also the point(s) at which the radius of Orvonton

is perpendicular to this sector line. This forms a 90 degree angle from Uversa to this point on the circumference and then to Paradise. These three points form a right triangle, which establishes a simple trigonometric relationship between the hypotenuse (the distance between Uversa and Paradise) and the radius of Orvonton. The distance from Uversa to Paradise (r_{PAR} is the hypotenuse) equals $r_{ORV} / \sin 25.7^\circ$. The sine of 25.7° is 0.434, and the reciprocal of this equals 2.31. Therefore, the distance from Uversa to Paradise should be 2.31 times the radius of Orvonton.

$$r_{PAR} = 2.31r_{ORV}$$

The distance from Uversa to the near periphery of the grand universe is just the radius of Orvonton. The distance to the far periphery on the opposite side of the grand universe is two times the distance to Paradise plus the radius of Orvonton. The full diameter of the superuniverse space level is twice the distance to Paradise plus twice the radius of Orvonton:

$$D_{far\ side} = 2(2.31r_{ORV}) + r_{ORV} = 5.62r_{ORV}$$

$$Dia_{SU} = 2(2.31r_{ORV}) + 2r_{ORV} = 6.62r_{ORV}$$

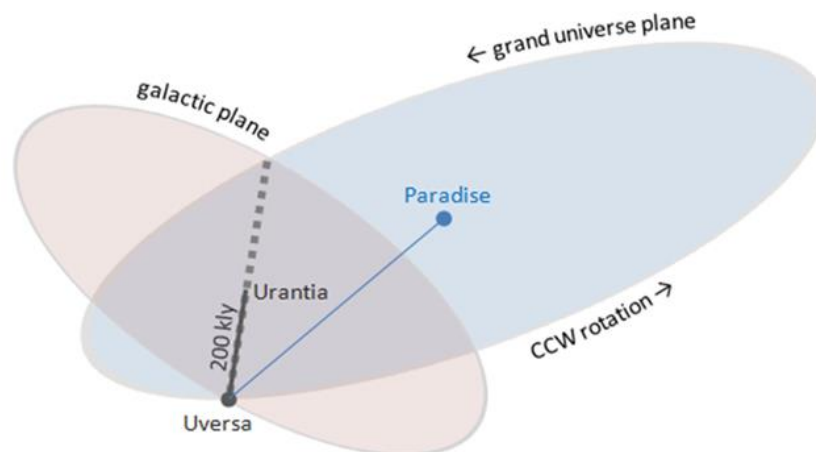
2. The Superuniverse of Orvonton

Urantia is located in Orvonton, one of the seven superuniverses. The capital of Orvonton is the architectural sphere of Uversa, the residence of the three Ancients of Days of Orvonton. Uversa is orbited by seven worlds which are “the seven higher universities of advanced spiritual training for ascending will creatures.” ^{15:7.10} Orbiting each of these seven higher university worlds are seventy specialized worlds. We are destined to sojourn upon each of these worlds, which “are concerned with your final spiritual preparation for Havona.” ^{15:13.3} We are third order spirits when we leave the major sector capital of Umajor the fifth for the “central training worlds of the superuniverse.” ^{31:3.4} “When spirit development is complete, even though not replete, then the surviving mortal prepares for the long flight to Havona, the haven of evolutionary spirits.” ^{30:4.26} The superuniverse of Orvonton will eventually contain one trillion inhabited worlds. ^{15:2.24}

A Mighty Messenger informs us that we are more than 200,000 light-years from Uversa, the physical center and spiritual headquarters of Orvonton, the abode of the Ancients of Days. “From Jerusem, the headquarters of Satania, it is over two hundred thousand light-years to the physical center of the superuniverse of Orvonton, far, far away in the dense diameter of the Milky Way.... From the outermost system of inhabited worlds to the center of the superuniverse is a trifle less than two hundred and fifty thousand light-years.”
^{32:2.11} The direction to Uversa lies through the “dense diameter of the Milky Way.” This appears to refer to the plane of the Milky Way galaxy, viewed from our location inside it, which is thought to have a radius of about 50,000 light-years. Uversa should lie within about 10 degrees of the gravitational plane of the Milky Way, obscured from view by its stars and interstellar dust.

Uversa and its architectural satellites are not near any suns. “The Star Students, the celestial astronomers, choose to work on spheres like Uversa because such specially constructed worlds are unusually favorable for their observations and calculations. Uversa is favorably situated for the work of this colony, not only because of its central location, but also because there are no gigantic living or dead suns near at hand to disturb the energy currents.” ^{30:3.2}
 The absence of “gigantic living or dead suns” near Uversa puts it in a location that is away from any astronomically observable structures at 200,000-250,000 light-years and not too far from the gravitational plane of the Milky Way.

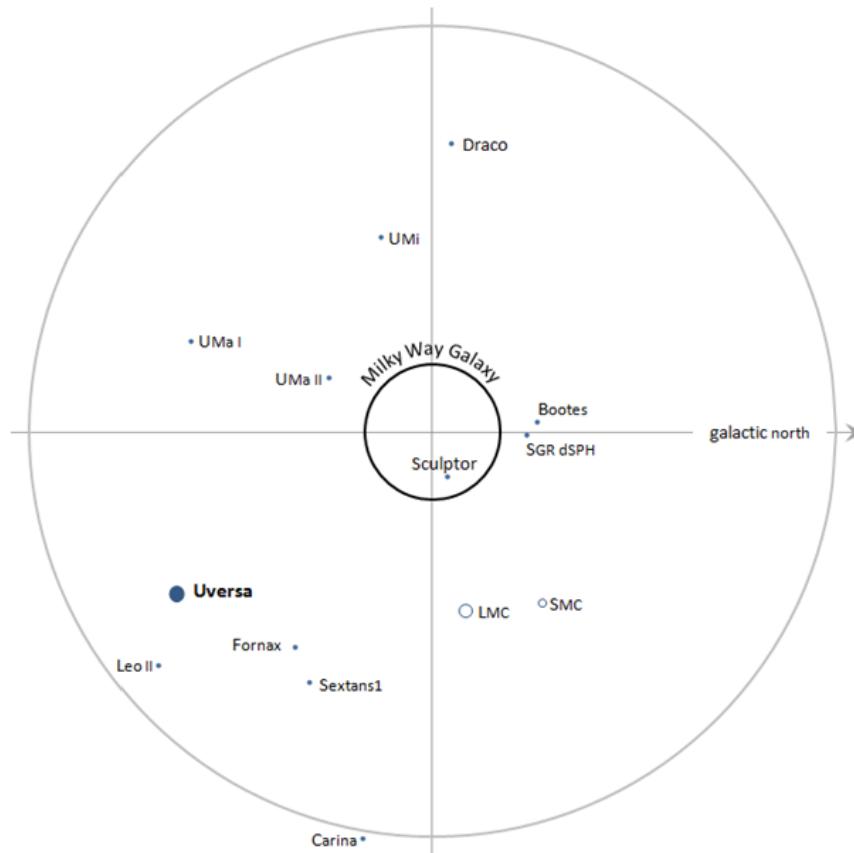
Fig 21: Location of Uversa at Intersection of Galactic and Grand Universe Planes



Being positioned behind the belt of Milky Way stars and away from other astronomical objects, the location of Uversa could lie anywhere along the 360

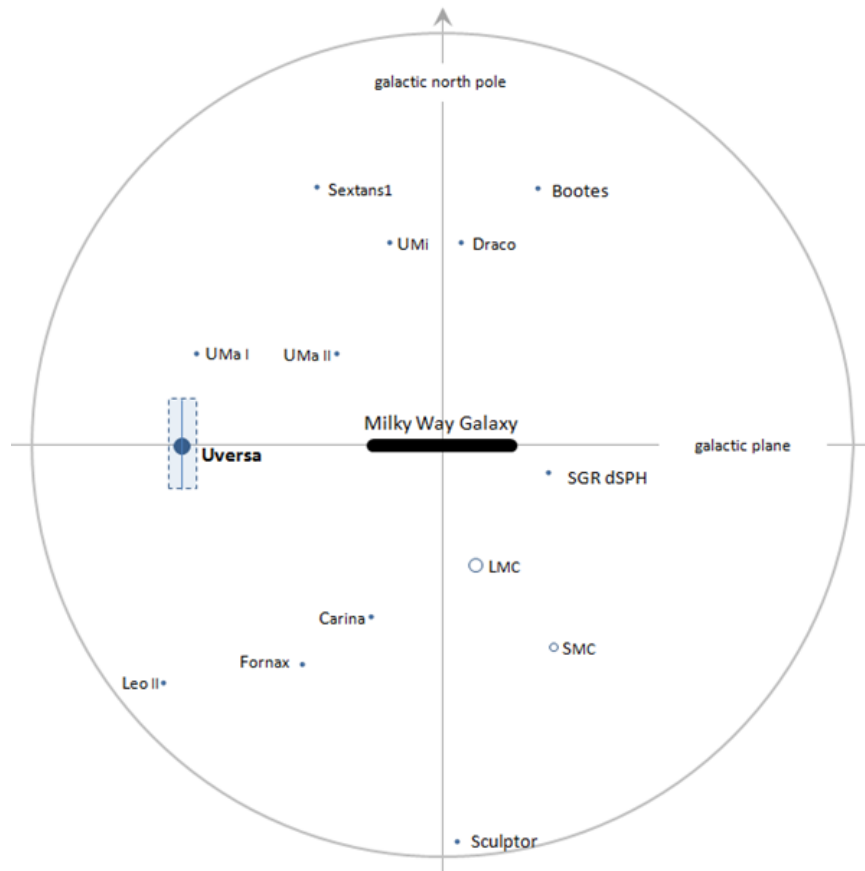
degrees of the gravitational plane of the Milky Way, plus or minus about 10 degrees of galactic latitude. Uversa is at the center of the gravitational plane of Orvonton. Uversa also lies in the gravitational plane of the grand universe, like the other six superuniverse capitals. In a later chapter it is shown that these two gravitational planes intersect along the line described by the galactic coordinates of $l = 32^\circ$ and $l = 212^\circ$ of longitude and $b = 0^\circ$ of latitude. The direction which places Uversa ahead of Orvonton, which is in counterclockwise revolution about Paradise, lies in the direction of longitude of $l = 212^\circ$.

Fig. 22: **Uversa and the Milky Way Starry System – Polar View**
Looking down on the galactic x-y plane out to 300,000 light-years



Uversa is more than 200,000 but less than 250,000 light-years from us in the general direction of $l = 212^\circ$, $b = 0 \pm 10^\circ$. Looking down on the plane of the Milky Way from the north galactic pole, Uversa is located in the lower left.

Fig. 23: **Uversa and the Milky Way Starry System – Side View**
Looking along x-axis at the galactic y-z plane out to 300,000 light-years



In the galactic coordinate system due north is defined by a line between us and the center of the Milky Way and its equatorial plane is the gravitational plane of the Milky Way. The ten major sectors of Orvonton, “the so-called star drifts,” ^{15:3.13} are in revolution about Uversa. “The Sagittarius sector and all other sectors and divisions of Orvonton are in rotation around Uversa.” ^{15:3.7} The star drift in which we dwell, the Sagittarius sector, is the Milky Way galaxy, which is estimated to have a radius of roughly 50,000 light-years. Our solar system, Monmatia, is located about 26,000 light-years from the center of the Milky Way.

Significant difficulties have been encountered in attempting to establish the size of Orvonton based upon the descriptions presented in *The Urantia Book*. Some studies conclude that our Milky Way galaxy might be Orvonton, while others interpret various statements to mean that Orvonton is a thousand times the size of the Milky Way galaxy. This enormous discrepancy in scale seems mostly due to the vagueness of several descriptions as well as a change in the

meanings of various descriptors over the last half century. Most of what is known today was unknown prior to the middle of the previous century. A problematic issue arising from this sudden advance in knowledge is a significant change in meaning of words such as “galaxy”, “cluster”, and “nebula.” Prior to the 1930s, the word “galaxy” was often synonymous with the idea of the whole universe. “Galaxy” and “nebula” now signify very different things from what they meant in 1934, when these descriptions were indited.

There was a sharp dispute over the size of the universe during the first quarter of the 20th century, although a majority of astronomers believed that the universe consisted only of the Milky Way. On April 26, 1920 there was a “Great Debate” between the well-known astronomers Harlow Shapley and Heber Curtis. Shapely argued the universe had “a diameter of at least three hundred thousand light-years,” while Curtis assumed “a maximum diameter of 30,000 light-years as representing sufficiently well this older view to which I subscribe though this is pretty certainly too large.”^[32] In 1923 Edwin Hubble discovered that several spiral nebulae, such as Andromeda, are too far away to be part of the Milky Way galaxy. This marked a fundamental change in the scientific view of the universe and the beginning of extragalactic astronomy as a discipline. In Hubble’s 1936 work *The Realm of the Nebulae* he identified eight members in the Local Group of galaxies.

The Milky Way is at the center of the superuniverse of Orvonton. “The vast Milky Way starry system represents the central nucleus of Orvonton.”^{15:3.1} A Universal Censor remarks, “Urantia belongs to a system which is well out towards the borderland of your local universe; and your local universe is at present traversing the periphery of Orvonton.”^{15:1.6} In conjunction with the knowledge that Uversa is no more than 250,000 light-years away from the “outermost system of inhabited worlds,”^{32:2.11} this appears to imply that the “Milky Way starry system” is Orvonton.

But the Universal Censor says a little further down in the same paper that Orvonton has ten trillion suns, eight trillion of which are observable. “The superuniverse of Orvonton is illuminated and warmed by more than ten trillion blazing suns. These suns are the stars of your observable astronomic system. More than two trillion are too distant and too small ever to be seen from Urantia.”^{15:6.10} If there are eight trillion potentially observable suns in Orvonton, then the Milky Way and its satellite nebulae are far too small to be our superuniverse.

Older studies estimate between 200 and 400 billion stars in the Milky Way. ^[33] A recent 2011 study using the improved technique of Very Long Baseline Interferometry (VLBI) persuasively shows that the mass of the Milky Way is comparable to the mass of the Andromeda galaxy. ^[34] This finding agrees with a 2009 study which also found that the Milky Way and Andromeda are comparable in total mass. ^[78] A 2006 population study of Andromeda gives an estimate of about one trillion stars. ^[31] These newer estimates give the Milky Way a mass of about one trillion suns. This is only about 12 percent of the eight trillion observable suns in Orvonton. The Milky Way cannot be all of Orvonton. As the nearest large galaxy at 2.5 million light-years (Mly), Andromeda, also containing a trillion solar masses, must be part of Orvonton. But we are told that Uversa is not more than 250,000 ly from the outermost inhabited system, which appears to place Andromeda far beyond the borders of Orvonton.

This confusion can be resolved by distinguishing inhabited from uninhabited regions in Orvonton. It is explicitly stated that all inhabited systems are within 250,000 ly of Uversa, that Orvonton is in revolution about Uversa, and that Orvonton contains eight trillion potentially observable suns. The Milky Way contains about one trillion suns. These definite statements and this fact can be reconciled if the majority of Orvonton is uninhabited at the present time.

“There are not many sun-forming nebulae active in Orvonton at the present time, though Andromeda, which is outside the inhabited superuniverse, is very active.” ^{15:4.7} This statement clearly implies that Andromeda is part of Orvonton, but it is outside the inhabited portion of Orvonton, which consists of the Milky Way. When we are told that Urantia is near “the periphery of Orvonton,” ^{15:1.6} the Universal Censor must be referring to the inhabited portion of Orvonton. The uninhabited portion of Orvonton must extend at least to the Andromeda galaxy, since Orvonton has 8 trillion observable suns. The Milky Way and Andromeda together account for perhaps one-quarter of the observable stars in Orvonton.

The Milky Way is a major portion of Orvonton, since our superuniverse contains eight trillion observable suns. Uversa, the center of rotation for our superuniverse, is only a couple of hundred thousand light-years distant. There are several trillion more suns in Orvonton, and all of them are gravitationally bound to the Milky Way. Andromeda must be part of Orvonton. Finally, the Milky Way and Andromeda are the largest members in the gravitationally bound structure known as the Local Group. The Local Group is the only cosmic structure with the approximate mass of Orvonton which could potentially be in revolution about Uversa. The Local Group of galaxies is Orvonton.

3. The Local Group

The idea that our galaxy and Andromeda should be grouped together was first proposed in Edwin Hubble's 1936 book, *The Realm of the Nebulae*.^[36] Hubble referred to our galaxy, Andromeda, and six other "nebulae" as the Local Group. Hubble listed the following eight definite members of the Local Group: the Milky Way, the Magellanic Clouds (LMC and SMC), the Andromeda galaxy (M31), M32, NGC 205 (M110), the Triangulum galaxy (M33), Bernard's galaxy (NGC 6822), and IC 1613.

Fig. 24: **Orvonton is the Local Group – Polar View**
Looking down on the galactic x-y plane out to 4.4 million light-years



The original eight members of the Local Group identified in 1936 by Hubble appear to be directly referenced by the Universal Censor in paper 15, which was indited in 1934. “Of the ten major divisions of Orvonton, eight have been roughly identified by Urantian astronomers. The other two are difficult of separate recognition because you are obliged to view these phenomena from the inside. If you could look upon the superuniverse of Orvonton from a position far-distant in space, you would immediately recognize the ten major sectors of the seventh galaxy.” 15:3.4 The Universal Censor says eight of Orvonton’s major sectors were already “roughly identified” in 1934. The Milky Way creates a so-called “zone of obscuration” extending roughly 10 degrees above and below the galactic plane, since the stars and dust in this plane obscure objects beyond the Milky Way. The other two major sectors appear to lie somewhere within this 20 degree high obscured zone centered on the plane of the Milky Way.

Fig. 25: Orvonton is the Local Group – Side View
Looking along x-axis at the galactic y-z plane out to 4.4 million light-years



Table 6: **Orvonton (Local Group) Members**

	<i>Galaxy Name</i>	<i>Alternate Names & Notes</i>	<i>Dist. (Mly)</i>
Milky Way System Satellites			
1	Milky Way Galaxy	^{a b c} (distance to the center)	0.03
2	Sagittarius Dwarf Spheroidal	^{a b c} SGR dSPH (disc. 1994)	0.08
3	Ursa Major II Dwarf	UMa II (disc. 2006)	0.11
4	Large Magellanic Cloud	^{a b c} LMC	0.16
5	Bootes Dwarf	Bootes I (disc. 2006)	0.20
6	Small Magellanic Cloud	^{a b c} SMC, NGC 292	0.21
7	Ursa Minor Dwarf	^{a b c} UMi Dwarf, DDO 199	0.21
8	Draco Dwarf	^{a b c} UGC 10822, DDO 208	0.26
9	Sextans Dwarf	^{a b c} Sextans I	0.28
10	Sculptor Dwarf Elliptical	^{a b c} E351-G30	0.29
11	Carina Dwarf	^{a b c} PGC 019441	0.33
12	Ursa Major I Dwarf	UMa I (disc. 2005)	0.33
13	Fornax Dwarf Spheroidal	^{a b c} E356-G04	0.46
14	Leo II	^{a b c} DDO 93 (disc. 1950)	0.69
15	Leo I	^{a b c} Regulus Dwarf	0.82
Local Group Members beyond Milky Way System			
16	Phoenix Dwarf	^{a b c} ESO 245-G007	1.44
17	Bernard's Galaxy	^{a b c} NGC 6822	1.63
18	NGC 185	^{a b c} UGC 396	2.02
19	Pisces Dwarf	^{a b c} LGS 3	2.02
20	IC 10	^{a b c} UGC 192	2.15
21	Andromeda II	^{a b c} Andromeda II Dwarf	2.22
22	Leo A	^{a b c} Leo III, DDO 69	2.25
23	IC 1613	^{a b c} UGC 668	2.38
24	NGC 147	^{a b c} DDO 3	2.48
25	Pegasus Dwarf	^{a b c} DDO 216	2.48
26	Andromeda III	^{a b c} PGC 2121	2.48
27	Andromeda Galaxy	^{a b c} M31, NGC 224	2.51
28	M32	^{a b c} NGC 221	2.51
29	Cetus Dwarf	^{a b c} Cetus Dwarf Spheroidal	2.54

Table 6: **Orvonton (Local Group) Members**

	<i>Galaxy Name</i>	<i>Alternate Names & Notes</i>	<i>Dist. (Mly)</i>
30	Cassiopeia Dwarf	^{a b c} Andromeda VII	2.58
31	Andromeda IX	^c (disc. 2004)	2.58
32	Andromeda V	^{a b c} (disc. 1998)	2.64
33	Andromeda I	^{a b c} (disc. 1970)	2.64
34	Andromeda VI	^{a b c} Pegasus II	2.67
35	M110	^{a b c} NGC 205	2.71
36	Triangulum Galaxy	^{a b c} M33, NGC 598	2.77
37	Tucana Dwarf	^{a b c} PGC 69519 (disc. 1990)	2.87
38	Wolf-Lundmark-Melotte	^{a b c} WLM, DDO 221	3.00
39	Aquarius Dwarf Irregular	^{a b c} DDO 210 (disc. 1959)	3.07
40	Sagittarius Dwarf Irregular	^{a b c} Sag DIG (disc. 1977)	3.39

possible members which may be beyond the zero-velocity surface *

41	Antlia Dwarf Irregular	^d (disc. 1997)	4.21
42	NGC 3109	^e DDO 236	4.24
43	Sextans A	^c UGC 205 (disc. 1942)	4.31
44	Sextans B	^c UGC 5373	4.44

* the zero-velocity surface is the estimated distance beyond which galaxies are not fully gravitationally bound to the Local Group and recede from us due to Hubble expansion

^a Sidney van den Bergh, 2000 ^[39]

^b Sidney van den Bergh, 2003 ^[40]

^c I. D. Karachentsev, 2005 ^[41]

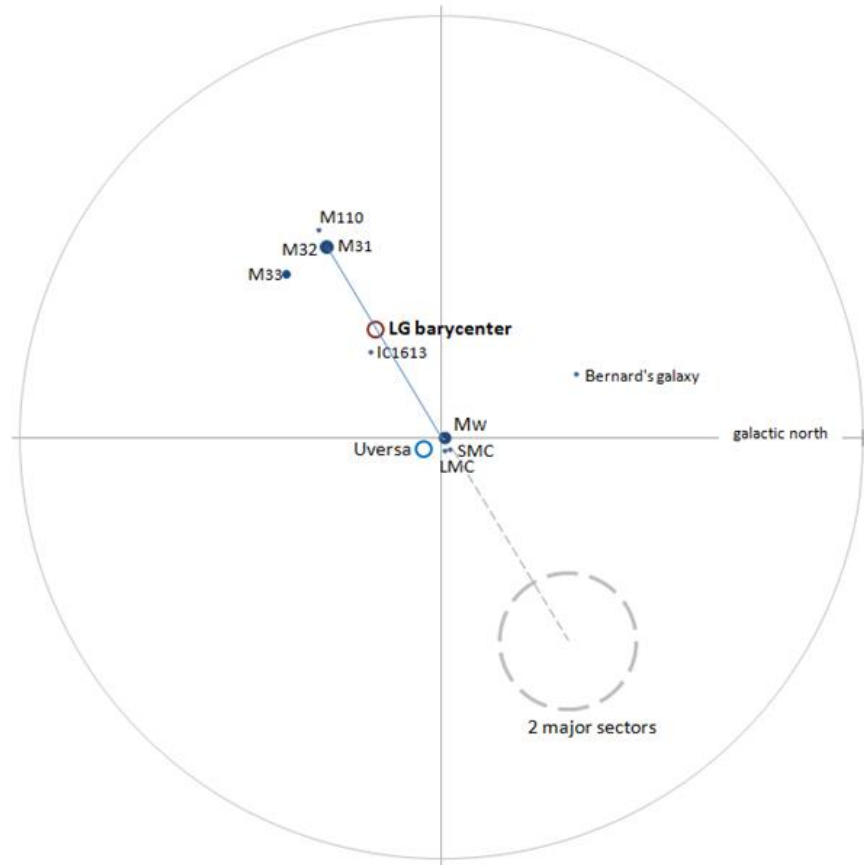
^d Alan B. Whiting, 1997 ^[42]

^e Chris Evans, et. al ^[43]

Since 1936, additional much smaller members of the Local Group have been identified. As of 2011 there are 40 positively confirmed members. The most remote one is the Aquarius Dwarf Irregular galaxy, about 3.39 Mly away. Another four galaxies are considered tentative members, since it is unclear if they

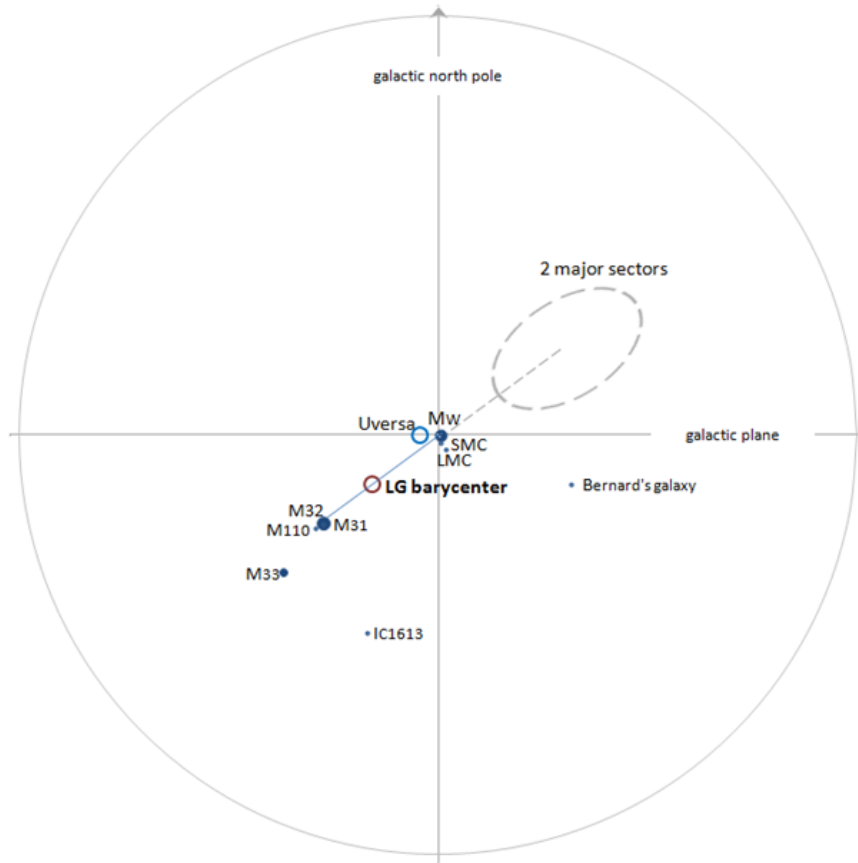
are fully gravitationally bound to the Local Group. These four possible members are at distances ranging from 4.21 to 4.44 Mly.

Fig. 26: **Hubble's Identification of Eight Major Sectors – Polar View**
Looking down on the x-y galactic plane out to 4.4 Mly



The ten major sectors of Orvonton are in revolution about Uversa. The two largest members of the Local Group (LG) are the Andromeda and Milky Way galaxies, each of which contains about one trillion suns. The Triangulum galaxy is the third largest member with roughly 50 billion suns. The high percentage of LG mass in its two largest galaxies requires that the center of mass, the barycenter, lie along a line between Andromeda and the Milky Way.

Fig. 27: **Hubble's Identification of Eight Major Sectors – Side View**
Looking along the x-axis at the y-z galactic plane out to 4.4 Mly



A 1999 analysis of mass distribution placed the LG barycenter at about 60 percent of the distance to Andromeda (1.42 Mly) in the direction of Andromeda ($l = 121.7^\circ$ and $b = -21.3^\circ$ in galactic coordinates).^[37] This would be closer to the Milky Way now, since its current mass estimate is two and a half to five times greater than it was in 1999. This is far removed from us and Uversa, which is within 250,000 ly. But we are told that two of the ten major sectors are “difficult of separate recognition,”^{15:3.4} presumably because they are located behind the diameter of the Milky Way. Since Orvonton revolves about Uversa, the center of mass for these two as yet unidentified major sectors must be located within or near the zone of obscurity. They could be near each other and lie more or less in the opposite direction from Andromeda or they could be widely separated in directions significantly different from the direction opposite to Andromeda.

Hubble was able to identify eight of the ten major sectors of Orvonton. These eight galaxies are roughly arranged in a linear structure between the Milky Way and Andromeda (fig. 26 & 27). The length of this structure is much longer than

its horizontal width or vertical thickness. This generally agrees with the revealed description of Orvonton's form. "The spheres of Orvonton are traveling in a vast elongated plane, the breadth being far greater than the thickness and the length far greater than the breadth." 15:3.2

4. Dimensions of the Grand Universe

The minimum radius of the Local Group is about 3.4 Mly and the maximum is about 4.4 Mly. Being informed that both the Milky Way and Andromeda are within Orvonton, and knowing that these are the two largest known members of the Local Group, it is clear that the Local Group constitutes a major portion of the superuniverse of Orvonton. A 2008 study of the Local Group estimates its total mass at about 5.27 trillion solar masses ($5.27 \times 10^{12} M_{\odot}$). [38] This is about 65 percent of the eight trillion potentially observable suns in Orvonton. This difference between the calculated mass of the Local Group and the stated mass of Orvonton is not unreasonable, given the significant difficulties in measuring the mass of the Local Group.

The internal structure of the grand universe permits us to estimate its various dimensions, using the radius of Orvonton. Orvonton has a minimum radius of between of 3.39 Mly, which is the distance to the Sagittarius Dwarf galaxy. Its radius might be 4.44 Mly, based upon the distance to the Sextans B galaxy. The uncertainty about the distance at which galaxies are no longer gravitationally bound can be represented by a radius of 3.92 ± 0.53 Mly. If Sextans B is, in fact, gravitationally bound, then Orvonton's radius would actually extend for some distance beyond this. This radius can be used with the revealed internal structure of the grand universe to predict some of its dimensions.

Table 7: **Calculated Dimensions of the Grand Universe**

<i>dimension</i>	<i>factor</i>	<i>r = 3.92 Mly</i>	<i>± Mly</i>
Distance to Paradise	2.31	9.06	1.22
Distance to the Far Side of the GU	5.62	22.03	2.98
Diameter of GU	6.62	25.95	3.51

The Andromeda galaxy is now estimated to be about 2.5 Mly distant. This disagrees with the distance cited by the Universal Censor, who writes in 1934 that the light from Andromeda takes almost a million years to reach us. This distance appears to trace back to a passage in Sir Arthur Eddington's 1927 book *Stars and Atoms*, where he gave a distance of 900,000 ly. This is significantly farther than the distance of 700,000 light-years used in 1936 by Edwin Hubble. By 1950 the estimate had increased to about one million light-years. By 1960 the estimate had grown to 1.6 Mly. Almost all distance estimates to Andromeda since 1985 agree on a distance of about 2.5 Mly. The stability of this estimate over the last thirty-five years, after being analyzed in almost sixty independent studies, is an indication of its validity.

This appears to be a clear instance of a specific limitation imposed upon the revelators by their mandate, restricting them from giving us certain facts of unearned knowledge: "...regarding the physical sciences ... new developments we even now foresee, but we are forbidden to include such humanly undiscovered facts in the revelatory records." ^{101:4.2}