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Surprising and Unexpected Discoveries the James Webb Space Telescope Will Likely Make: Based Upon Our Research

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Abstract

The following research study and assessments involve predictions of the future observations of the James Webb Space Telescope (JWST) concerning its most distant observations and related cosmology theory. Our research began in 2014 and is based upon astronomical observations published by many groups starting from 2008, and ending in the spring of 2022. Observations involve the Hubble (HST), the ALMA radio telescope array, and a number of other telescopes including other infrared scopes. General conclusions and predictions of this research and paper are that the same kinds of galaxies and clusters observed at the furthest possible distances by the Hubble Space Telescope and other telescopes, will continue to be observed by the JWST at the farthest observable distances, and that none of the expected Big Bang related observations will be observed such as the dark ages, the epoch of Reionization, population III stars, or a panorama of only young blue newly-forming galaxies, nor the first stars of the universe, etc. Although we expect that some astronomers might initially claim that the most-distant JWST observations conform to predictions of mainstream cosmology, and have observed some of these predicted eras of theory. In time, however, we predict it will become apparent to many or most that mainstream cosmology is being contradicted by the James Webb observations at the farthest distances. Based upon our research, this will be because the universe is many times older than what the Lambda Cold Dark Matter model and the Hubble distance formula could allow – and that the Perfect Cosmological Principle will eventually be realized as being valid concerning the observable universe and JWST observations.

Keywords: James Webb observations, distant universe, predictions of observations, mainstream cosmology, alternative cosmology

1. Introduction

The James Webb Space Telescope will be referred to in this paper as the JWST, or sometimes the James Webb. The uses of the words “we” and “our,” and related plural pronouns in this paper refer to one or more research associates, plus the author, who agree with a particular statement, prediction, or conclusion of this paper. We use the word “prediction” meaning our assertion based upon the evidence presented. Sometimes we use the word “expect” instead of “predict” which would have a similar meaning as prediction but with less evidence presented.

Anyone can make verbal predictions of astronomical observations, and sometimes they may come true, but predictions alone would have little merit without adequate justification and explanations for them. Even if such predictions turn out to be true, their justifications may in time be proven wrong.

Based upon our research and related insights, we are making a number of alternative predictions for the JWST, often involving alternative theory, equations, and related justifications. Since most expectations for the JWST observations listed here are well known, we will explain our alternative predictions and their reasoning compared to the mainstream predictions. Our predictions are based upon prior astronomical observation anomalies presented and discussed in this paper that we believe are pointing in the same theoretical direction, and often are the evidence and support for our predictions.

The basis for the title of this paper primarily concerns future observations of galaxies at the farthest observable distances by the JWST. Nearly all of the past observations explained in this paper involve dilemmas concerning mainstream theory, where sometimes mainstream adjustment-of-theory were considered and discussed by astronomers and theorists following their observations and publication. At the farthest observable distances at the time of their observation, a few large galaxies and galaxy clusters appear to be very old, overly red, and oversized for their calculated distances, with few new stars forming. And a few central galactic black holes at these greatest distances appear to be already oversized compared to the galaxy's size, since for most galaxies their central black hole is generally proportional to the size of the galaxy. To be consistent with mainstream cosmology, a few of these entities would need to have formed almost instantaneously in situ to be consistent with their calculated redshift ages and mainstream cosmology.

According to our research, the ratio of such contradicting, large red galaxies (many red stars within them), and old-appearing galaxies at the farthest distances, has remained generally consistent and has not changed or decreased with increasingly distant observations. Our research indicates that this trend has not subsided with seemingly never-ending galaxy formation theory contradictions, even as our telescopes continue to extend our observable horizons, which we predict will continue with the James Webb. We therefore predict that these same kinds and percentages of contradicting most-distant-galaxy observations will continue in the same proportions as we observe them close-by with the JWST. If so, we expect that because of the many contradicting observations discovered, and continuously discovered new ones, that there will come a time not too many years from now, that ad hoc adjustments to mainstream cosmology will no longer be easily proposed or made without many questioning the validity of mainstream cosmology and its theoretical foundation pillars.

2. Discussion

Nearly all astronomical observations are now interpreted based upon Lambda Cold Dark Matter Cosmology. Although most observations so far at the greatest observable distances have so-far been interpreted by most astronomers and theorists to be in accord with mainstream cosmology, some observations have been interpreted by some groups as appearing contrary to mainstream cosmology, even though few such publications have been released.

Our research, this paper, and our comments were updated from June 2022, before the James Webb went up, to January 2023, after the first pictures of the JWST have been released and preliminarily analyzed. This update is minimized, however, by the fact that each observing group of astronomers following the first released JWST pictures in July of 2022, have 6 months of exclusive priority analysis of their own observations (observation photos) and analytical data before their photos and analyses must be released.

Below we will be discussing some of these anomalies and possible inconsistencies concerning mainstream cosmology. Because the Galaxy pictures by the JWST at the farthest observable distances appeared the same as we predicted, we continue to predict that future JWST observations at the farthest distances will appear to be very similar to the first released photos, and very similar to the Hubble Deep Field pictures. At that time we expect some mainstream cosmologists will suggest new ad hoc hypothesis to explain these anomalies and apparent contradictions, while others will look toward alternative theory of an older universe – which we predict will eventually result in major changes to mainstream cosmology, expectedly 3-4 years from now.

Prior to the James Webb, our most powerful space telescope was the Hubble. Astronomers' prior use and experience with infrared telescopes is listed below.

There are also many ground-based infrared telescopes around the world. Some of the largest of these are/ were:

VISTA

UKIRT

IRTF

WIRO

There also have been a number of prior infrared space telescopes. Some of the more permanent ones are shown below, with their infrared frequencies compared to the James Webb.

Name and Launch Year	Wavelength frequency µm
Spacelab Infrared Telescope (IRT) 1985	1.7-118 µm
Infrared Space Observatory (ISO) 1995	2.5-240 µm
Hubble Space Telescope, infrared Spectrograph (STIS 1997)	.115-1.03 µm
Hubble Near-Infrared Camera and Multi-Object Spectrometer 1997	0.8-2.4 µm
James Webb Infrared Space Telescope 2022	0.6 -28 µm

It has been more than a decade since the last launching of an infrared space telescope before the James Webb, and almost two decades since a "permanent" infrared scope went up before the James Webb. Because of the much larger size of its combined mirrors, its ultra-low temperature, and its placement at the second LaGrange point away from the reflected light of the Earth and moon, much more is expected of the JWST concerning better observations of the most distant galaxies and universe.

Because of astronomers' prior experiences with infrared telescopes and because of its increased clarity and cloud penetrating ability, it will generally be easier for astronomers to interpret JWST observations of galaxies and distant entities. But it also will be just as easy to misinterpret JWST observation anomalies at the farthest distances if Big Bang (BB) cosmology is wrong.

If only small, young, blue-appearing galaxies (adjusted for redshifts) will be observed at the farthest possible distances, then all cosmological models proposing an older or infinite age universe would most likely be wrong, which includes our proposed model here.

On the other hand, if at the very farthest observable distances, some old appearing, very large, red appearing elliptical and spiral galaxies are discovered, especially galaxy clusters and galaxies with observably high metallicity like the Milky Way, then these observations would be in accord with cosmological models of a much older universe, which would include our model. This would be evidence that the present Big Bang model would likely be wrong, which is our expectation and prediction.

This paper and its predictions strongly relate to contradictions of mainstream cosmology and what they expect to see, and what we predict will not be seen by the James Webb. Most expect to see the so-called cosmic eras called the "dark ages," the "era of last scattering," "the era of recombination," "the era of the first stars being formed (so-called population III stars," the "era of the first galaxy formations," and the era of the first "galaxy cluster formations," etc. These are all things <u>we predict will not be observed</u>, even though we expect that some groups could claim otherwise, based upon interpretations of their own observations. The reason why we make these predictions is that our model proposes a type of steady state universe concerning, a universe much older, but one that is not infinite in size or age. We predict that the James Webb will provide evidence for this prediction, in that nearly all photos at the greatest distances will look very similar to the Hubble Deep field photos, and photos showing the insides of local galaxy clusters.

The following is a list of present Big Bang (BB) theory problems that we believe will be greatly magnified by James Webb observations, based upon our research and the observations explained below. The specific observations discussed are just a few of the more unusual observation anomalies, of the great many others we encountered in our research concerning the most distant observed galaxies in nearly a decade.

3. The Anachronistic Galaxy Problem and Related Observations

We anticipate the following group of observations may be the most obvious single Big Bang problems that will be recognized and spotted by the JWST. From the Hubble and other scopes there have been a great many observations by many different groups of astronomers that have come to the conclusion that some of the most distant galaxies seem very old appearing, very large and mature appearing, rather than young appearing. This is exemplified by the listing of some of these observations explained and referenced below.

It stands to reason that the most distant and therefore first-to-form galaxies, according to the Big Bang model, should be small, young blue galaxies with mostly first-generation stars within them. This does not appear to be what is being observed at the greatest distances. Instead there have been a few, very large, old-appearing galaxies at the farthest distances, observed by many different groups of astronomers. Some of these most-distant galaxies appear to be filled with old appearing red stars; others appear to be very large spiral and elliptical galaxies, like the Milky Way and its large neighboring galaxies.

3.1 Observation: Old-Appearing Galaxies at the Greatest Observable Distances

1. This most distant and very recent observation exemplifies this problem: An international team of astronomers, including researchers at the Center for Astrophysics Harvard & Smithsonian, have observed what is believed to be the most distant galaxy ever seen before the JWST photos, with a redshift of $z > 12$. This discovery was published April 2022 in the Astrophysical Journal, with an accompanying paper in the Monthly Notices of the Royal Astronomical Society Letters.

2. This large, believed to be fully formed galaxy was named HD1, which was calculated to be 13.5 billion light-years away. Scientists have just begun to speculate exactly what this galaxy might consist of and how such a large fully-formed appearing galaxy could exist at such an early age of the universe. According to their statement, the same team said they will soon observe HD1 with the James Webb Space Telescope to further clarify their observations and calculations.

The team has initially proposed two possible preliminary ideas concerning this galaxy's excessive brightness, and also consistent with the standard model of cosmology based upon its supposed "very young" age. The first proposal was that HD1 may be forming very large, bright first generation stars at a very high rate and could be home to many Population III stars. The second idea is that HD1 may contain a super-massive galactic black hole calculated as being more than 4 times more massive than the Milky Way's central galactic black hole, Sagittarius A.

The lead author of this study said: "Answering questions about the nature of a source so far away, can be challenging," says Fabio Pacucci, of the *MNRAS* study. Determining the causes of this galaxy's appearance seems like it could ultimately become "a long game of analysis and exclusion of implausible scenarios," regarding mainstream theory.

HD1 is also extremely bright in ultraviolet light, another observation anomaly for such a distant galaxy. To explain this, Pacussi said: "some (unexpected) energetic processes are occurring there or, better yet, did occur (many) billions of years ago."

https://www.scientificamerican.com/article/astronomers-spot-most-distant-galaxy-yet-13-5-billion-light-years-from-earth/

At first, researchers thought HD1 was a large starburst galaxy, a galaxy that is creating stars at a very high rate. From their calculations of how many stars HD1 appears to be producing based upon the galaxy's brightness, "HD1 would have to be forming more than 100 stars every single year. This rate is at least 10 times higher than what we expect for these galaxies" (Yuichi, Harikane et. al., April 2022). If their mainstream interpretations were correct, they speculated that galaxies could have been different in the beginning universe. If not, this anomalous observation seems to contradict mainstream cosmology, as do many distant galaxies that have already been observed at the greatest distances, and the countless more we expect will be observed by the James Webb.

3.2 Observation: Old Appearing Galaxies Ten Billion Light Years Away, Hubble Ultra-Deep Field Survey

The Hubble Ultra-Deep Field Survey (UDS) overview image, was an image containing over 100,000 galaxies, with an area four times the size of the full moon. This single search image allowed "… astronomers to look back in time over 10 billion years, producing images of galaxies in the Universe's infancy," based upon mainstream theory) (Massey, 2008). Dr. Foucaud, of the UDS project said: "our ultra-deep (field) image allows us to look back and observe galaxies evolving at different stages in cosmic history, all the way back to just 1 billion years after the Big Bang," but the big problem then turned out to be that "we see galaxies 10 times the mass of the Milky Way already in place at very early epochs."

Further analysis of the UDS also had continuously surprising results according to astronomers, paraphrased below: The distant galaxies identified can be considered elderly because they appear to be rich in old, red appearing stars, not because of their redshifts which would make them less than 4 billion years old according to the Hubble distance formula. The presence of such fully formed and evolved red-appearing galaxies so early in the universe is hard to explain based upon present theory, and has been a major puzzle to astronomers studying how galaxies first formed and evolved(Galaxy Formation Theories) (University of Nottingham, 2008); (Hubble Deep Field, 1998).

Dark matter has been proposed by some astronomers as a possibility to explain how such supposedly young galaxies could have evolved into modern-looking galaxies at a very young age, according to theory. But that still wouldn't explain how a few of them could have become so super-massive at the theorized beginnings of the universe and also appear to be so fully formed, elderly, and also so dormant.

3.3 Observation: Very Distant Old-Appearing Very Massive Galaxies Observed in the HST's Ultra Deep Field

The Ultra Deep Field UDF survey were observations made by the Hubble Space Telescope (HST) for the purpose of detecting the most distant galaxies with sometimes follow-up observations using the Spitzer Space Telescope, the European Southern Observatory Very Large (USO VLT), and other scopes. One of the galaxies they were observing, HUDF-JD2, has a redshift of z = 4.8, which according to mainstream theory was only about 800 million years old in the beginning universe (viewed by both Hubble and Spitzer 2005). One of the astronomers, Nahram Mobasher of the European Space Agency, said: "This galaxy made about eight times more mass in terms of stars than there are in the Milky Way, and then must have suddenly stopped forming stars appearing to have aged prematurely."

A related article concerning this observation goes on to explain: The leading theory of galaxy formation holds that small galaxies merged to form larger ones. But the newfound galaxy is so large and massive at such an early stage of the universe that some astronomers and theorists have proposed that at least some galaxies must have formed more quickly in situ in a monolithic manner (Mobashert, 2005).

Galaxies more massive than the Milky Way in the early universe would have necessarily formed very rapidly in situ rather than coalescing from smaller galaxies over time. Even so, how could it be possible according to mainstream theory for such large galaxies to appear to be so old in the beginning universe? It would seem nearly impossible that such very large galaxies could have had time to form from scratch in less than a billion years, according to present galaxy formation theory while having many red, very old appearing stars within them.

We predict that the James Webb will see a great many such old appearing galaxies in the early universe, but with a small percentage of such galaxies as in the local universe. Some galaxies also appearing to be the same as galaxies in our local neighborhood, which according to their observable stars, are calculated as being six to twelve billion years old – even more greatly compounding the cosmological problem.

3.4 Observation: Very Distant Red Appearing Quiescent Galaxies With Many Old Appearing Red Stars Within Them, Would Seem to Strongly Challenge BB Theory

The following set of observations are now a well-known observation anomaly. Astronomers using The Spitzer Space Telescope discovered four extremely red galaxies in the distant universe, near each other with similar redshifts. Jiasheng Huang of the Harvard-Smithsonian Center for Astrophysics, lead author of the research and discovery in 2011, said "We've had to go to extremes to get the models (theory) to match our observations." The authors noted that "this is a dangerous statement to make since it is suggestive of having to force models to fit (mainstream) theory, often a sign of wrong theory," they said.

Galaxies can be very red for several reasons, they said. They might be very dusty. They might contain many old, red stars, and they can be very distant, but all three reasons combined together should not apply to galaxies at the beginning of the universe. All four galaxies appear to be relatively close to each other based upon their grouped appearance and similar redshifts. We see these galaxies as they were only about a billion years after the supposed beginning of the universe, according to theory -- an era when the first galaxies accordingly formed, and are supposed to have been young appearing, small, very active blue galaxies. This is the exact opposite of what we have observed concerning this group of four galaxies, they said (Aguilar, 2011).

Does the "forced data" suggest the possibility that a new, presently un-known type of galaxy could have existed at the beginning of the universe, they speculated? In terms of probability based upon mainstream cosmology, it seems very unlikely that these ultra-red galaxies should exist at all at these great distances and therefore not unsurprising that current computer models had to be forced to the data in an vain attempt to provide explanations related to mainstream theory. If more of these types of galaxies are observed in the most distant universe, as we predict they will be using the JWST, then such a grouping of galaxies would still be expectedly rare as they are in our local universe or any observable part of it at any time and age.

Concerning observations of 2.1 through 2.4 above, although they represent a small minority of galactic observations, we predict the same portion and kinds of very large, red, old appearing, and quiescent galaxies will be observed by the James Webb at the farthest observable distances, with better clarity and certainty, as exemplified by 2.1 above.

3.5 Distant Galaxy Clusters Seem to Contradict Theory

Not just old appearing galaxies, but large, old appearing galaxy clusters have been observed at the furthest observable distances. If this happens with the JWST at its further observable distances, then all will know the biggest theoretical problems have arrived.

3.5.1 Observation: A group of astronomers and scientists used several telescopes, the USO VLT, the XMM-Newton telescope, and the Chandra X-Ray observatory to analyze the CL J1449-0856 galaxy cluster and stated that its "properties imply that this structure could be the most distant, mature cluster known to date and that X-ray luminous, elliptical-dominated clusters are already forming at substantially earlier epochs than previously known" (Gobat, 2010).

They also said: "our results show that virialised clusters with detectable X-ray emission and a fully established early-type galaxy content were already in place at redshifts $z > 2$, when the Universe was only ~3 Gyr (billion years) old. While it took them several years of observations to confirm this structure, they said upcoming telescopes like the JWST and future X-ray observatories should be able of routinely find and study similar clusters, unveiling their thermodynamic and kinematic structure in detail. The census of $z > 2$ structures similar to CL J1449+0856 will subject the assumed Gaussianity of the primordial density field to a critical check" (Gobat et. al. 2010).

We predict that continuously more of these mature looking galaxy clusters will be detected in a theoretically young universe—and, more importantly, if they are detected even much further away as could be detected by the JWST —then this would more strongly contradict BB cosmology, as we predict the JWST will do.

3.5.2 Observation: A research team and study led by Andrew Newman confirmed "that JKCS 041 is a rich cluster and derived an average redshift of $z = 1.80$ (~9.9 billion light years away) via the spectroscopic identification of 19 member galaxies, where more than 3/4rs of the galaxies observed were quiescent," 15 of 19 galaxies are no longer producing stars (Newman, 2014). "This indicates a large, ancient (appearing) galactic cluster past the peak of its star-forming period" -- which would seem to be totally contrary to mainstream cosmology.

Other possible theory contradictions they discovered:

They "constructed high-quality composite spectra of the quiescent cluster members that reveal prominent Balmer and metallic absorption lines." Young, early-generation stars (as should be expected in young, early-generation galaxies) should not have notable metalicities as do these galaxies.

"We find no statistically significant difference in the mass/radius relation or in the radial mass profiles of the quiescent cluster members compared to their field counterparts." Galaxies in clusters are expected to be larger than isolated galaxies due to their increased opportunity to coalesce. This does not seem to be the case here; both cluster and field galaxies appear to have similar sizes and appear to have grown at the same rate as their neighbors (Newman et. al.2014).

3.5.3 Observation: Young in Theory, Old in Appearance

An international team of astronomers using instruments on the ESO's Very Large Telescope to measure distances to a curious patch of faint red light began to see the hallmarks of a very distant galaxy cluster. Its distance was calculated based upon its average redshifts, which indicated that the galaxy cluster was no more than three billion years old according to the Hubble distance formula. This galaxy cluster grouping was named CL J1449+0856.

"They found evidence suggesting that most of the galaxies in this cluster were no longer forming stars, but were primarily composed of stars that already appear to be old and mature. The cluster was estimated to be similar in mass to the Virgo Cluster, the nearest rich galaxy cluster to the Milky Way."(Gobat, 2011. Because of their old appearance, older galaxies in the Virgo cluster that appear similar to those in this cluster are estimated to be between 8 and 12 billion years old – yet the age of the same appearing galaxies in this cluster are no more than 3 billion years old, according to their redshift and the Hubble redshift distance calculator and its calculation limit of 13.8G light years.

4. The Universe Density Problem

This is not just a JWST problem; it has been a problem with the Hubble Space Telescope and all past telescopes. Most observation-studies, past and present, seem to find it very difficult to judge the density of the universe at any given redshift or era, or be able to compare the density of one cosmic era with another. Based upon the expanding-space model, theory requires that the density of the universe was progressively greater in the past. The density of the universe must increase as we look back in time based upon the asserted expansion of the universe via space. This has never been corroborated by observation and published to the present day, according to our research. Our statement can be verified by searching and finding little or no related studies or evidence comparing the changes in density of the universe over time, whereby the universe was denser in the past. Some have used hypothetical dark matter to claim otherwise. We think this absence is greatly disturbing since the validity of the Big Bang model requires, via the expansion of space, a much denser universe in the past. But to the contrary, a lesser, or the same density has been observed at all eras of the universe. Why has this never been seriously questioned and greater research funded for such a project?

Based on the expanding space model, the Hubble distance formula and the volume of a sphere in a "flat" universe, when the observable universe was half its present age (and diameter) after the Inflation era, it would have been eight times denser with matter, primarily observable as galaxies. At a quarter its present age and diameter, it would have been 64 times more dense compared to now, based upon a relatively constant rate of expansion since the hypothetical Inflation era. With accelerated expansion such differences in density would even be greater. These are not small differences. How could dark matter change this Since the HST has detected galaxies from calculated distances of ~13.2 billion years away in a universe ~13.8 billion year old, such great differences in densities should be apparent if mainstream cosmology were valid. The Inflation hypotheses cannot change this since, according to theory, expansion has accordingly continued near the present observed rates after the Inflation era ended. But deep-field studies have not observed greater densities. Instead we appear to see the opposite: observed galactic densities decrease the farther back in time we look. The general ideas as to why this might be true are summarized in an excerpt from an astronomy website and papers by Springbob 2003, and related link:

http://curious.astro.cornell.edu/about-us/97-the-universe/galaxies/cosmology/531-why-does-the-apparent-density-of-galaxies-drop-off-at-larger-distances-advanced

The most common explanation for the recognized decreasing density of galaxies over time is that it's harder to see details of things that are farther away. So while we can see almost all the galaxies nearby, we can only see the brighter galaxies further away. According to this explanation, this effect overwhelms everything else and is responsible for the density of galaxies in galaxy studies and density maps progressively dropping off at ever increasing distances. So accordingly if one looks at galaxy density maps, they can imagine that there are actually many more small galaxies surrounding the larger ones that we just can't see.

Our answer to this: Of course the above is true, but the lack of smaller, less luminous galaxies cannot explain the comparative scarcity of galaxies in the universe, for instance seven billion years ago when, as stated above concerning expanding space, the universe should have been about eight times denser with matter and galaxies, as well as more galaxy mergers should be observable, which they're not. Adjusting for estimates of the reduced visibility and clarity of the intergalactic space in those times, there still should have been many times the number of observable galaxies than what we can see now, as galaxies do not take many billions of years to form based upon present observations and theory.

There are number of other mainstream explanations as to why we do not see a denser universe as we look back in time, but none of these explanations seem credible to many.

5. Relative Density, Velocity, and Mass Studies and Calculation Formulas

Contrary to mainstream theory, we expect any universe-density study by the James Webb will observe that galactic densities will appear to fall off according to the equation in **5.1** below. Without observational support, claims of increased densities of the universe in the past would be based upon theory alone without justification in the face of a great deal of contradicting evidence.

Another prediction from this research: The average distance between large galaxies in a cluster will generally fall off in past epochs of the universe, which would be comparable to the average density of the universe with matter in past epochs. Measurement will follow the simple formula $\mathbf{d_1 = (z + 1)^{.5}\, d}$, where d would be the average distance between galaxies in a local galaxy cluster like the Virgo cluster, and 'd_1' would be the average comparative distance for more-distant galaxy clusters, and 'z' is the observed redshift. For instance if 'z' = 1, then the equation would calculate the increased average distances between galaxies in a cluster to be 1.414 times greater than for a local cluster, the square root of 2. For a redshift of 8, this would calculate to be 3 times the average distances between galaxies in the Virgo Cluster (local universe), for instance. This might be a valuable calculation and consideration for the James Webb astronomers or other scopes peering at the greatest distances, to save time and focus effort when looking for the nearest galaxies to ones already being observed.

This and the other equations presented below were formulated based upon matter getting (relatively) smaller over time rather than space expanding. Of course this is not mainstream physics. The appearance of densities of the universe progressively decreasing in past epochs would also be contrary to mainstream cosmology (Noble, Cooper 2014).

Of course mainstream astronomy would assert that the beginning universe should be very dense with galaxies, but our research indicates that there is no age of the universe that this could would be true. Steady State cosmologies based upon the expansion of space concept, like Hoyle's model might put the average past distances between galaxies at half the distance that we predict above, which would be d_1 = (**z +1)$^{.5}$/2,** since the average expansion rate of space could have been half of what we presently observe now at such great distances due to the average rate of expansion between here and there, then.

One should note that these equations are close to linear, meaning that the greater the redshift and farther back in time we look, the greater the distances between galaxies should be and the less dense the universe would appear to be according to these equations. But as will be explained, **Photos by the James Webb so far appear very similar to the Hubble Deep Field photos. This will be because, according to alternative theory presented here, the size of matter relative to the size of space is exactly the same as it is today**, according to the diminution of matter and scale changing theory being presented here (Noble, 2017).

The theory of an expanding universe has never been confirmed by observation since the first analyses and estimates of galactic densities were conducted. Ever since then observations have been contrary to expanding space and a denser universe in the past. A few have tried the throw dark matter into observations claiming a denser past universe, but have seen little acclaim for their interpretations. This contradiction of theory has never been acknowledged for the many reasons explained above. Many could understand that there would be peer pressure against any galactic density study and its publication if its conclusions might be questionable or contrary to mainstream theory.

6. The Anachronistic Super Massive Galactic Black Hole Problem

According to decades of observations by astronomers, the central galactic black holes of galaxies appear to form from matter within the galaxy and grow in size in proportion to the galaxy. The bigger a galaxy gets, the bigger its central black hole usually gets. But finding central galactic black holes the size of the Milky Way's central black hole, Sagittarius A, is an obvious theoretical problem when observed in galaxies near the theoretical beginnings of the universe, since our galaxy and central black hole has been estimated to be about 12 billion years old or older.

6.1 Observation: Examples of Observed Oversized Distant Black Holes

Submillimeter Array observations of galaxy 4C60.07 "now suggest that such colossal black holes were common even 12 billion years ago when the universe was only 1.7 billion years old and galaxies were just beginning to form" (Aguilar, 2008). Finding two such galaxies with very large central black holes relatively close to each other with similar redshifts is very unlikely. Astronomers said: But "…. one of the galaxies seems quiescent, and the other active; both are about the size of the Milky Way." As can be realized, such observations contradict mainstream cosmology and add to the anachronistic huge galactic black hole problem (Aguilar, 2008). Of course mainstream cosmologists could speculate, that for some galaxies their central black hole could have formed first via dark matter, and later the galaxy could have formed around that dark matter. But if such hypotheses are often proffered without well-founded support, then galaxy formation theory would become more questionable, and vulnerable to replacement over time.

6.2 Galaxy Formation-Theory Problems

The James Webb is expected to be able to look back to the beginning of the universe, according to the Big Bang model and the universe age limit of ~13.8G years via the Hubble distance and age formula. Based upon our research, we predict that the James Webb will see the same kinds of galaxies and galaxy clusters observed by the Hubble Space Telescope and other scopes that have observed galaxies at the greatest distances. We predict the James Webb will not be able to better explain galaxy formation problems explained herein, but instead because of its accuracy, will just add to theoretical contradictions.

The anisotropies (non-uniformities) that hypothetically would have been produced by an expanding universe — either by inflation or by expansion alone — would not seem to be sufficient to allow enough time for such large galaxies to have formed so early in the beginning universe based upon mainstream theory. We predict an even bigger problem will be compounded by the JWST observations which will relate to finding galaxy clusters, webs of galaxies, as well as all of the observed large intergalactic anomalous structures that have already been observed toward the beginning universe, discovered at ever greater distances, and to be fully formed at the beginnings of the universe would be a theory breaker if they are found by the JWST.

6.3 Galaxy Formation Contradictions

To explain this theoretical problem and related observations, theorists have modeled the theoretical period following hypothetical Inflation, forming new ever-changing hypothesis trying to explain the large observable galactic and intergalactic structures that have appeared so early in the universe, by one means or another. Since this is only theory with questionable supporting evidenced other than computer modeling, the weakness of validation-by-model is that if the model is incorrect, it can always be tweaked until it is "correct." Even then, there is the risk that new observations — such as the Large Quasar Group four billion light-years across discovered using the HST in 2013 (Klotz, 2013)— which required fine-tuned model addendums, in a continuing process of fine-tuning and changes in fine tuning, but with continuous surprises rather than predictive power(Trefil, 2010)(Stephen Battersby, 2011).

Since we expect that mainstream cosmology will continuously be contradicted by the JWST observations, our prediction is that in less than 4 years, much of mainstream cosmology will be in the process of change or replacement because of the barrage of contradictions that we expect will be revealed by James Webb observations. The primary theme of these contradictions and our assertion is that some of the most distant observed galaxies, as well as the universe, are many times older than mainstream cosmology and the Hubble distance formula could allow. Maybe the best and most recent example of this so far is the most distant galaxy observed and discussed in section 2.1 above.

7. The Metallicity Problem and JWST Observations

Atomic nuclei heavier than hydrogen are created by nuclear fusion within stars. The simplest fused element is helium. The word "metals" in astronomy is characterized by all elements heavier than helium. Latter-generation stars are made up of the ejecta from earlier generation stars that underwent nova or supernovae processes that expelled heavier elements into interstellar space. This means that early-generation stars should be metal poor, and that hypothetical Population III stars (first generation stars) should be mostly metal-free, as would be expected concerning the first stars of the universe.

Stars should become more metallic for each subsequent stellar generation. Therefore, distant galaxies being part of a younger universe of early generation stars should have many stars of lower metallicity than galaxies of today, according to mainstream cosmology. But that's not what has been observed, as explained below, or what we predict will be observed by the James Webb.

7.1 Observation: Metallicity of Galaxies and Quasars at Great Distances, Contradict Theory

The quasar SDSS J1148+5251 is "hyper-luminous" and resides within "a high metallicity galaxy in the early universe" (Galliano, 2015). With a redshift of $z = 6.42$ makes this quasar about 13.4 billion light years away, according to the Hubble distance formula. This means that the quasar and its galaxy would be about 400 million years old based upon BB theory and the Hubble distance formula, which is the average lifetime of the largest metal-producing stars. However, "various metal tracers, like the [FeIII], [MgII], and [CII] lines, as well as the large amount of CO and dust emission observed, indicate a nearly solar metallicity." This is an indication of a much older galaxy. The Sun is a Population I star about 4.5 billion years old; this quasar and galaxy near the supposed beginning of the universe its metallicity should not resemble that of a quasar and galaxy at almost the beginning of the universe.

The quasar's dust content and metallicity might be explainable by mainstream theory by a huge population of super massive, short-lived stars with almost "instantaneous" recycling. But researchers also estimated that "previous studies overestimated the star formation rate of this galaxy by a factor of 3-4." (Gallerani, 2017). Since all of this speculation is highly unlikely, no good explanations remain concerning the quasar's observed metallicity totally contradicting mainstream cosmology.

We predict the James Webb will further contradict mainstream theory in time, via its observations of galactic metallicity in the early universe, because of its much better cloud penetrating vision – although at first we expect some interpretations will assert otherwise.

8. The Distance vs. Brightness Problem

The accepted method of calculating cosmological distances involves redshifts and is based upon the accuracy of the Hubble distance formula. Type 1a supernovae — generally considered standard candles concerning their brightness — were slightly dimmer (~10%) than expected at a redshift of $z = .6$ (about 6 billion light years distant) resulting in a parabolic curve of brightnesses vs. redshifts rather than a linear distributions. This unexpected result necessitated the proclamation of dark energy by mainstream theorists and the Nobel Prize granted to two different observing groups of astronomers.

But if the Hubble distance formula underestimates distances by about 10% at a redshift of $z =.6$ with even more error at greater distances, then astronomers could come have come to the wrong conclusions concerning the characteristics of distant galaxies. That the characteristics of galaxies were different in the past was one of the two conclusions that put the Big Bang model into prominence and acceptance over its rival the Steady-State theory (SS) at the time. The other conclusion was that the cosmic microwave background radiation (CMBR) and its uniformity could be best explained by the heat from a beginning Big Bang event; now theorized as being the heat from a hypothetical Epoch of Recombination. The Steady-State explanation of the Microwave Background Radiation (MBR) was that its heat was the result of the greatly redshifted background field of forever-distant galaxies, although the MBR's great uniformity was more difficult to explain via SS theory (Wikipedia, Static Universe, 2021).

Based upon observations by the Hubble and other scopes, we predict the James Webb will continue seeing the same kinds of very large overly bright galaxies. If a few of these bright galaxies are also overly red, at least a few astronomers thinking out-of-the-box should consider the possibility that at least some of these galaxies are not starburst galaxies, but simply large old galaxies that should not exist at all at the farthest distances of the observable universe, and that there is something wrong with mainstream theory.

8.1 Alternative Distance, Brightness, and Time Dilation Equations

$$r_H = \frac{v}{H_0} = \frac{\beta c}{H_0} = \left[\frac{(z+1)^2 - 1}{(z+1)^2 + 1}\right]\frac{c}{H_0}$$

The Hubble distance formula above is one of the foundation equations of the Big Bang Theory. This formula is based on an expanding universe which was first formulated by the acknowledged founder of the Big Bang theory, Georges Lemaître. Besides the Big Bang model, Hoyle's et. al. Steady State model also proposed an expanding universe. But for all Steady State (SS) theories like Hoyle's, the Hubble distance formula, with the Hubble constant, has a time and distance limit to it concerning the age of the universe, which is contrary to all SS theories. Find a justifiable reason to replace or alter the Hubble distance formula or constant, then the universe could be many times older via the new formula, and observations could then be in accord with theory. Hoyle's SS model proposed a direct relationship between distances and redshifts but did not propose an exact formula for calculating distances and time passed.

All Steady State cosmologies propose a much older universe, and most propose an infinite age and size of the universe.

Very few theorists have proposed an alternative to the Hubble distance formula that can hold up under scrutiny. The author believes his formulation of 2014, shown below in 8.1, will pass the test of time. With this formula, dark energy does not exist. Type 1a supernovae can be observed at their calculated distances with no change in their expected brightness – where the Hubble distance formula underestimates distances of type 1a supernova, and therefore all cosmic entities, by about 10% at a redshift of z = .6 based upon our study of the time(Noble, Cooper, 2014). This was the reason that mainstream cosmology claimed the existence of dark energy in the first place.

The question then arises as to what is more likely – that the Hubble formula is off by about 10% at a redshift of z -.6 (about 6 billion light years away), or that about 70% of the observable universe is made up of unseen energy that is pushing the universe apart? We believe the former choice is far more likely since both can explain what is being observed. Comparing the Hubble distance formula with the Pan Distance formula below was done by our associate Joseph Mullat in his study, as well as testing his own distance formula calculations:

https://www.researchgate.net/publication/348973177_An_Experiment_comparing_Angular_Diameter_Distances_between_Pairs_of_Quasars.

If the James Webb sees the same kinds of observations that the Hubble saw at even greater distances and clarity, we predict eventually it will be realized that something is wrong with mainstream cosmology. Instead, the proposed alternative linear distance equation, 8.1 below, has no distance or age limit to it. It was derived based upon a Pan Theory premise, the diminution-of-matter rather than the expansion of space. It calculates distances and a universe many-times older than what the Hubble distance formula and constant could allow. It has no limit to the distances that can be calculated, proving the redshift 'z' can be determined.

http://www.pantheory.org/hubble-formula/ (Noble, Cooper 2014)

http://www.pantheory.org/ (Noble, 2017)

8.2 Alternative Distance Equation

Type 1A supernovae data was garnered in 2012 by the author of this paper, from published type 1a supernovae observations. This supernovae data and the Pan Theory were the basis to derive the alternative distance equation shown below. Based upon observations by the James Webb, If what has been predicted above is realized as a possible problem with mainstream cosmology, then the alternative distance formula below could be tested to calculate the furthest distances observed by the JWST, to determine if its calculations better fit what is being observed.

$r_1 = 21.2946 \log_{10} [.5((z+1)^{.5} - 1) + 1](z+1)^{.5} P_0$ Mpc (Noble, Cooper, 2014) (Equation 1)

Where 'r_1' is the distance in megaparsecs, 'z' is the observed redshift, *and* 'P_0' is a constant related to distance = 1,958.3. The above equation was derived by the author regarding this past study of type 1a supernovae, and based upon the Pan Theory of cosmology. This same equation, Equation 1, formulated in a "more elegant" form is seen below, the distance r_1 =

$$18110.607641 \cdot \ln\left[\left(\frac{1+\sqrt{1+z}}{2}\right)^{\sqrt{1+z}}\right] \text{ Mpc}$$

This form of the equation was reformulated by Joseph Mullat, an acknowledged research associate of this paper.

These formulas are based upon the diminution of matter rather than the expansion of space. This formula is simply a function of the redshift input just like the Hubble formula, and the link below performs its automatic calculations and compares distances to the Hubble formula.

http://www.pantheory.org/hubble-formula/ (Noble, 2017)

The above calculation does not end the distance calculation based upon the definition of the term "light year." In mainstream astronomy a light-year is both the distance light travels, and also the time it took light to travel that distance. But in the alternative cosmology, the Pan Theory and formula above, a light year is only the distance that light traveled based upon the measuring rods of today which would be much greater.

According to the alternative cosmology, matter in the past was relatively larger as was the measurement of the distances of space. The speed of light would accordingly have been the same, the ratio of distance to time traveled. So if distances were relatively greater in the past than we measure them now, based upon our present measuring rods, then time would have to have been dilated as we see in supernovae events – the event is longer in accord with the equation $(1+z)^{.5}$, as all astronomers in that field would know based upon hundreds of type 1a observations. So for light year measurements concerning time or the "actual distance" light traveled on its trip, one would divide the calculations of Equation 1 by the dilation equation $(1+z)^{.5}$. A simple example of this would be a distant galaxy at an observed redshift of z = 8. Following the $(1+z)^{.5}$ equation, the square root of 9 = 3, so the "actual distance" and the time it took for light to travel to us based upon today's measurement of time, the results of equation 1 calculations would be divided by 3.

Our alternative cosmology, the Pan Theory, also requires an additional formula to calculate brightnesses since galaxies would appear to have been both larger and brighter in the past, according to our research and scale relativity theory involved. This formula calculates increased brightness which would be somewhat diminished by increased distances, but still resulting in the characteristic of "over-brightness" in comparison to Hubble calculated distances and the inverse square law of luminosity.

8.3 Alternative Brightness Formula

The mainstream brightness formula in physics and cosmology is the inverse -square law of light. The light intensity *l*, is proportional to 1 divided by the square of the distance; $I \propto 1/d^2$*, the relative brightness to the same light close by.* The alternative Pan-brightness formula where redshifts are involved is:

$L = 2.512 \log_{10} [[((z+1)^{.5} t - 1)).5t + 1](z+1)]$ (Equation 2)

Where 'L' is the calculated brightness (luminosity),'z' *is* the observed redshift, and 't' is the calculated timeframe involved, equation below. This formula is also based upon the diminution of matter rather than the expansion of space. The diminution of matter asserts that matter and brightnesses from the past will appear to be brighter than they really were in their own timeframe because matter would have been larger, and EM radiation more intense, but also involves greater calculated distances via the distance formula above.

t = 9.996 log10 [(1+z).5] (Equation 3)

The formula above calculates the changing rate of time over distance (Noble, Cooper 2014). In mainstream physics the lengthening of time concerning the observations of distant-events increases according to the mainstream equation $(1+z)^{.5}$ as explained above. The mainstream explanation of this is based upon the expansion of space, but this time dilation does not follow the Hubble constant of the Hubble distance formula to some extent, which we believe is a clue that something is wrong with the Hubble distance formula concerning observations. The alternative time equation is shown above which calculates based upon the diminution of matter rather than the expansion of space, but both calculate the same or to similar results concerning smaller redshifts involving nearly all type 1a supernovae. As Einstein explained, time is also a function of relative motion and the influences of gravity, which does not involve this formula.

Time, accordingly, is also a function of cosmic distances, and its rate also changes (“dilates”) from our perspective. The alternative cosmology is called The Pan Theory. It is based upon the diminution of matter (matter getting smaller) over time rather than the expansion of space, but any scale-changing theory or scale relativity theory of a similar magnitude would probably make similar predictions, equations aside.

Both the alternative distance and brightness equations above are linear. Increasing distances and brightnesses are proportional to the changes in redshifts. These combined equations produce a distance/brightness trend line resulting in a generally straight-line graph, as would be expected for supernovae events being standard candles when the “correct” distances are calculated using the correct formula, without the existence of dark energy (Noble, Cooper 2014). This does not require invoking any phenomena that cannot be directly observed or one disprovable: as the diminution of matter rate is constant and all mathematical operations in the model have explicit mechanical explanations; it cannot be ‘tweaked’ to force flatness comparing brightness to redshifts.

We predict the James Webb will continuously be observing a few large, old appearing, overly red, overly bright galaxies at the farthest distances, which theorists will eventually realize almost completely contradict mainstream cosmology. We predict that the percentage of such galaxies will be the same as we can observe in our local universe.

Note: As in the Note of section 3.1 above, the above equations in Section 8 involve scale changing theory, the relativity of timeframes to measurement scales. Some of such theories are quite simple like this proposal, with only one scale-changing equation over time. Others are called Scale Relativity theory, of which there are many; but these can involve a number of equations. All the equations above would accordingly calculate correctly based upon present-day measuring scales and “sticks.” But in the reality of timeframes in the distant past, distances and brightnesses would have appeared the same as measurements today, when using larger measuring sticks and larger measuring scales – that would look exactly the same as our measuring sticks in their own timeframes (based upon relatively larger matter in the past). Instead of space expanding, matter would be very slowly getting smaller, roughly 1,000th part ever 7 million years; so space would appear to us to be expanding. The creation of new matter from the decrement at the base of Active Galactic nuclei would be required to maintain a steady-state density and condition.

9. The Dark Ages, Period of Reionization, and Predicted Observational Contradictions

The James Webb Space Telescope is expected to be able to look back to the cosmic Dark Ages predicted by the Big Bang model. A primary mission of the James Webb Space Telescope is to search for the first light to supposedly shine in the universe. But our prediction, based upon our research, is that the JWST will not see the first light since the theory behind the expectation, mainstream cosmology, will eventually be proven wrong by JWST and other contradicting observations.

According to our prediction, there were no so-called cosmic dark ages or hypothetical transparent Period of Reionization believed to follow it. The “Dark Ages” era is believed to be the boundary between the old, dark obscured universe, and the newer, transparent one, according to BB cosmology. But we predict the James Webb will not see any hypothetical eras of the universe, which must eventually be validated by observation in time or be discredited in time.

10. Brief Summary of Each Above-Pridicted Problem as It Relates to Future Observations of the James Webb Space Telescope

The Anachronistic Galaxy Problem: This asserted problem relates to some old-appearing large galaxies being seen at the farthest observable distances by the James Webb, which according to theory should appear very young. We predict that these most distant galaxies will likely be the most obvious theory-contradicting observations of the James Webb, exemplified by 2.1 above.

Distance and Brightness Problems: This asserted problem would exist for any expanding-universe model like the BB model, or any model that uses the Hubble distance formula and constant to calculate distances, and the inverse square law of light to calculate brightnesses. The problem will show up as unexpected galactic brightnesses and energy intensity in the distant past via the James Webb.

The Anachronistic Super massive central galactic Black Hole Problem: This past observation anomaly will be observed by the James Webb where, in time, we predict it will become another obvious contradiction of mainstream cosmology.

The Metallicity Problem concerning the JWST observations: We predict the JWST and other telescopes will observe the characteristic of metallicity in its most distant observations, similar to what has already been discovered in distant galaxies, and similar to what we find in our own galaxy, contrary to mainstream cosmology concerning the supposed beginning universe.

The Dark Ages and Period of Reionization: Although mainstream cosmology predicts the James Webb will likely be able to see the hypothetical Dark Ages and the Period of Reionization, we instead expect, based upon prior observations, that astronomers will not be able to see either, because they never existed.

10.1 Reasons for the Above Conclusions and Predictions for the James Webb Space Telescope

Based upon our research of the many telescopic observations that we have presented and the many others not discussed and the alternative theory presented, we have concluded that:

1) The universe is many times older than what mainstream cosmology could allow.

2) For the farthest observable galaxies and entities, the distances, the size of galaxies (matter), and their excessive brightnesses, will be many times greater than what mainstream theory can allow; the alternative theory and equations are presented above.

11. General Conclusions, Predictions, and Basis of the Alternative Theory Presented

Our general conclusion (a prediction) is that the most distant observations of the JWST will, in time, be proven contrary to the general predictions and expectations of mainstream cosmology. We predict this is because the observable universe is in a generally steady-state condition, somewhat fractal rather than in an expanding, degrading entropy form as presently asserted by Big Bang cosmology. This has been evidenced by the most distance JWST observations looking very similar to the Hubble Deep Field photos, as well as looking very similar to photos looking inside local galaxy clusters.

We predict that the theorized universe formation eras of the Big Bang model will not be observed since the Lambda Cold Dark Matter model is simply wrong.

Using the alternative steady-state theory and the observations presented, we predict galaxies in the most distant universe will have the same variation in shapes, sizes, form, and brightnesses that we observe in our local universe. But if so, we realize that the observations by the JWST will be interpreted based upon mainstream cosmology and therefore will be very difficult for observers to understand based upon mainstream theory.

A**ll static universe or steady-state universe theories of an older or infinite age universe could make the same or similar predictions that we are making, using the same observation references that we have presented for their support** – but would not make the same numerical predictions that our unique equations make -- which can test the validity of the alternative cosmology being presented, the Pan Theory of Cosmology, against the mainstream LCDM model or any other alternative cosmology – based upon both JWST observations and large radio-scope ground based array observations.

Maybe the most significant aspect of this research is that it points to a path that readers, astronomers, researchers, and theorists alike can follow if the James Webb contradictions continue for years, which we have predicted. It points out that all involved should not only consider mainstream theory to explain observation anomalies, but to also consider that other possibilities explained herein, such as the alternative steady-state theory presented herein, will expectedly better explain these JWST observations. Steady State theories (SS) are numerous and some very different from Hoyle's et. al. original SS theory. The steady state cosmology being presented here is a prime example which has many unique equations that can be tested against observations, which will expectedly better match observations than mainstream theory calculations. See alternative equations on pages 16 & 17 above, also calculated by the link below based upon a redshift input value denoted as 'z':

http://www.pantheory.org/hubble-formula/

By looking also to alternative theory possibilities, researchers have the possibility of coming to better conclusions more quickly, possibly saving a great deal of time and money along with the possibility of showing a clearer path for all to follow concerning cosmological theory in the coming years – and the possibility of mainstream cosmology being changed or replaced maybe within 4 to 5 years primarily based upon JWST observation anomalies, our prediction.

If continuously contradicting observations are eventually recognized as theoretical problems by James Webb astronomers as we predict, we would hope that some will investigate, test, and consider, for the few that will have knowledge of it, whether the Pan Distance and Brightness equations, and the other theoretical equations presented here, will better match JWST observations than mainstream cosmology. The Pan Distance and Brightness formulas and calculator, link below, is programmed to make distance and brightness calculations solely as a function of redshift input data, while automatically comparing calculated results with distances calculated by the Hubble distance formula, and brightnesses calculated by the inverse square law of light.

http://www.pantheory.org/hubble-formula/

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