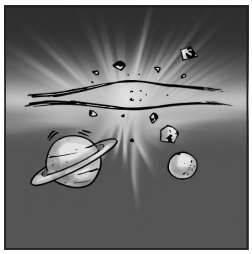
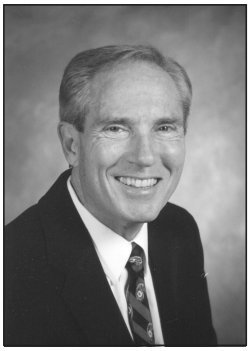


Collapse of Big Bang Cosmology and the Emergence of the New Cosmic Center Model of the Universe

Robert V. Gentry



Robert V. Gentry

God does not intend that his record of the literal six-day creation and seventh-day Sabbath rest … to lapse into obscurity and ridicule without providing … scientific evidence that affirms these records.

It is good that respected theorist J. Brian Pitts has contested my refutation of Big Bang Cosmology (BBC).[1] This gives opportunity to show that its huge nonconservation-of-energy losses are genuine, that its key spacetime expansion hypothesis is false, and that its expansion redshifts are mythical entities, without any physical reality. In making these discoveries, I point out that cosmologists committed modern science's greatest faux pas by decades-long promotion of BBC while, incredibly enough, never bothering to test its key spacetime expansion postulate experimentally.[2] These results invalidate BBC's explanation of the Hubble redshift relation, its identification of the 2.7K Cosmic Blackbody Radiation (CBR) as relic radiation, and show that its Cosmological Principle has always been science fiction.[3] This led to my discovery that the locally observed, spherically symmetric galactic redshift distribution is unique and hence that a universal Center exists nearby.[4] I identify it as the location of God's eternal throne, as per Hebrews 8–10 and Revelation 20. Finally, I describe my Cosmic Center Universe model that reproduces eight of BBC's major predictions.[5]

Before launching into my response to Brian Pitts' article, the reader is entitled to understand just what it is about my scientific work that he is challenging. They are also entitled to know the philosophical basis of my work in order to more intelligently evaluate my findings, both those now under discussion, and those obtained earlier. The Bible says God will not give his glory to another. To me this means he does not intend that his record of the literal six-day creation and seventh-day Sabbath rest, as given in Genesis and in the Fourth Commandment, to lapse into obscurity and ridicule without providing the scientific community and the world with scientific evidence that affirms these records. This approach necessarily means I believe there are flaws in the current evolutionary paradigms, and that part of revealing God's glory of creation means exposing the scientific flaws in these paradigms as well as promoting those evidences of creation that affirm the Genesis record. This is the philosophical basis of my work, and I realize it is a minority view, both scientifically and within the Christian community. It is also controversial; so Pitts has done the Christian scientific community a great service by attempting to expose what he thinks are its defects. My scientific response to Pitts is necessarily couched within the framework of my philosophical view. I have done so in a forthright manner, trusting that if I have run the race by just beating the air, the readers of this response will respond accordingly and show me the errors of my ways.

In the last few years, I have reported several discoveries that I claim either falsify big bang cosmology directly or disprove its fundamental postulates.[6] Briefly these discoveries are:

1. Big bang cosmology involves gargantuan nonconservation-of-energy losses equal to the mass/energy contained in a universe

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thirty million times the size of our own.[7] This denial of energy conservation on a universal scale proves that at least one of the theory's fundamental postulates must be fallacious and hence that the theory must be fallacious.

2. The universe is relativistically governed by Einstein's static spacetime general relativity (GR) instead of the Friedmann-Lemaître expanding spacetime postulate upon which the big bang is critically hinged.[8] Disproof of this fundamental postulate proves that neither big bang's spacetime expansion nor expansion redshifts even exist. Without the latter, everything in the big bang collapses.

3. The decades-long belief that the 2.7K Cosmic Blackbody Radiation (CBR) is big bang's relic radiation is proven false because the many hundreds of thousands of astronomers and cosmologists who have promoted the theory over the past fifty or more years committed one of the greatest errors in the history of science when they failed to include a critically important term in the equation they developed to compute big bang's prediction of the present CBR temperature.

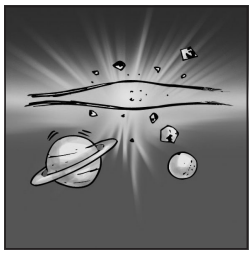
When I discovered this missing term and modified the resulting equation accordingly, then as shown herein, I found two things of extraordinary consequence: First, instead of big bang's temperature prediction of the CBR agreeing with the experimentally determined 2.7K, actually it is more than a million times less.[9] This means what has been thought of as BBC's greatest success is now exposed as its greatest contradiction. Secondly, I found big bang's hypothesized rate of expansion-induced photon wavelength increase, which is the foundation of its expansion redshifts, depends on both the present value of H, the Hubble constant, and its hypothesized existence at time of emission, H_e.[10] On this basis, every photon in the universe—whether having originated locally, or in distant galaxies, or in the CBR—has a memory of the hypothesized H_e at emission and, in some mysterious way, must be instantaneously processing that value in order to universally synchronize the rate of wavelength expansion for every photon with the same value of H_e. For photons in the CBR, which supposedly originated 13.7×10^9 years ago, this memory must stretch back that far and instantaneously induce the same change wherever those photons are in the cosmos now. Such a requirement is a bizarre contradiction to all of modern quantum electrodynamics, but actually no more bizarre than BBC's acceptance of gargantuan nonconservation-of-energy losses.

Thus, what appeared to be modern science's and big bang's greatest twentieth-century success has turned into its worst twenty-first-century nightmare. This fatal contradiction to its CBR temperature prediction—as well as its demand for photons to be inscribed with H's value at time of emission—falsifies the entire theory, thus proving it never happened.[11] And because the big bang never existed, neither was there ever a Hubble constant different from the present one. Furthermore, I found that disproof of expansion redshifts opens up exciting new vistas both on the structure of the universe as well as the biblical implications of this structure. Without expansion redshifts the big bang has no explanation of the Hubble redshift relation and no explanation for the 2.73K CBR. A new model of the universe is needed, not dependent on spacetime expansion and expansion redshifts.

Instead of big bang's temperature prediction of the Cosmic Blackbody Radiation agreeing with the experimentally determined 2.7K, actually [I discovered] it is more than a million times less.

In particular, astronomers and cosmologists have long promoted expansion redshifts to justify the idea that observers on any distant galaxy would detect the same spherically symmetric distributions of galaxies and quasars as seen on Earth. But disproof of expansion redshifts immediately invalidates the Cosmological Principle, which led me to understand the universe is truly spherically symmetric about only our point of observation, or some point that is astronomically nearby.[12] Obviously this location must be none other than the Center of the entire Universe.

My discovery of the nearby universal Center forms the basis of my new Cosmic Center Universe (CCU) model which postulates that the universe is relativistically governed by Einstein static spacetime.[13] In it galaxies are physically receding from this nearby Center in accord with the standard Hubble redshift relation, and the Hubble constant has a new, well-defined meaning in terms of a true measure of the rate of recession. In this new model, galactic redshifts are attributed to a combination of relativistic Doppler and gravitational redshifts. The force driving galactic recession from the nearby Center is cosmic repulsion due to the repulsive force of the vacuum. The 2.7K CBR is shown to be gravitationally redshifted blackbody cavity radiation from an anciently-created outer shell of galaxies (see note 59) that circumscribes those of the more recently-created (6,000 yr.) visible universe. This model deserves scientific attention as a replacement for the big bang because it matches eight of big bang's most promi-



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nent predictions, as well as predicting the existence of galaxies with redshifts >10, which is far higher than that allowed by the big bang. Additionally I herein suggest the CCU model also deserves attention from the biblical perspective as well, for I believe this physical Center is also the Command Center of the Universe, none other than the location of God's eternal throne where, as described in Hebrews 8–10, Christ is now ministering his blood in behalf of all who are calling upon him for salvation. On that basis, I believe God created the visible universe, that is within the ancient outer galactic shell, so as to focus attention on this nearby Center as a means of attracting even greater attention to the divine ministry of Christ that is now continuing there.

I believe these discoveries complement my earlier ones in nuclear geophysics. Beginning over three decades ago, I repeatedly published evidence in the world's leading scientific periodicals[14] showing that polonium radiohalos that originated with primordial polonium left their worldwide imprints in Earth's foundation rocks, the granites. The brevity of the relevant polonium half-lives, stretching from the geologically-short 138 days for ^{210}Po, to the very brief three minutes for ^{218}Po, to the virtually instantaneous 164 microseconds for ^{214}Po, provide unambiguous evidence that all of these rocks were the result of God's divine fiat creation of planet Earth. It is significant in this respect that, in Heb. 1:10 and similar passages, the Bible refers to Earth's foundation rocks as those made in the beginning. This proof of Earth's rapid creation—which has remained unrefuted in the open scientific literature for over three decades—disproves evolutionary geology's claim that the Earth formed by slow cooling over billions of years. In my view, God purposefully formed these creation halos—the Fingerprints of Creation—to provide unambiguous evidence that he called the Earth into existence just as the Bible states in Ps. 33:6, 9. And I believe he did so to glorify his name, just as he left his Signature of Cosmic Creation—the nearby universal Center—to point to him as Creator and Sustainer of all, and Author (John 1:1–3) of the literal six-day Genesis record of creation, as affirmed in Exod. 20:8–11.

Nonconservation of Energy Is Recognized in the Big Bang—Why Does Brian Pitts Attempt To Deny It?

I believe most scientists other than big bang practitioners would agree that any theory that is found to significantly violate energy conservation must be badly flawed and should be quickly relegated to the trash heap, regardless of how highly esteemed it may have been held prior to such a finding. But in the big bang, things are different, and I should think that Pitts would be aware that its huge inconsistencies have long been openly accepted and taught in prestigious universities. Concerning energy in the big bang, take, for example, renowned cosmologist Edward Harrisons' widely used text *Cosmology: Science of the Universe*.[15] His frank admissions concerning nonconservation-of-energy in the big bang appears in the section entitled "Where has all the energy gone?" There we find the following:

> Radiation, freely moving particles, and also gases lose energy in an expanding universe. Where does the energy go? We take for granted that light is redshifted and usually do not concern ourselves about where the energy has gone (p. 275).
>
> The conclusion, whether we like it or not, is obvious: energy in the universe is not conserved (p. 276).
>
> Science clings tenaciously to concepts of conservation, the most fundamental of which is the conservation of energy principle … The conservation of energy principle serves us well in all sciences except cosmology … To the question of where energy goes in an expanding universe and where it comes from in an collapsing universe the answer is—nowhere, because in this one case energy is not conserved (p. 276).

Obviously these descriptions have been in print in an authoritative format for over two decades. During this period, there was virtual silence about them. Neither Pitts nor any other scientist brought this contradiction of known physical laws to the focus of attention in the open scientific literature. I attribute this, first, to the fact that big bang

cosmology (BBC) is almost universally accepted as ultimate scientific truth. With this mindset, it follows that whatever the theory requires also must be true, irrespective of how many contradictions it involves, even to defying energy conservation. What may have awakened Pitts to now attempt to defend energy conservation in the big bang scenario is that in 1998, for the first time ever in print, David and I published just how much energy was lost in BBC's nonconservation scenario.[16]

Big Bang's Cosmic Expansion Is a Mirage That It Leads to Gargantuan Nonconservation-of-Energy Losses

According to big bang theory, the universe is undergoing spacetime expansion, and there supposedly exists at any time what is known as the cosmic expansion factor, $\Re(t) = \Re$. Despite its fundamental importance, the mysterious thing about this expansion factor is that its value at any point in time is unknown. In fact, no one has ever proposed how it could be measured. So if big bang practitioners had told the whole truth about it, they should have long ago admitted they had no direct experimental evidence that it has ever existed. The first thing we need to understand about big bang cosmology is that it has always been based on a huge leap of the imagination. But cosmologists and astronomers have never admitted to this. Indeed, it is a topic they have studiously avoided. Instead they introduce an assumption that tends to cover up the imaginary status of the cosmic expansion factor. Without any experimental or theoretical justification whatsoever, or any direct physical evidence that expansion even exists, they claim cosmic expansion has an effect on photons.[17] They hypothesize that a photon that is emitted with some standard wavelength, λ_s, at time, t_0, when the cosmic expansion factor is $\Re(t_0) = \Re_0$, will during its transit have had its wavelength increased by cosmic spacetime effects until it is absorbed. At that point, the expanded wavelength is presumed to be given by the equation, $\lambda = \lambda_s (\Re/\Re_0)$, where $\Re$ is the presumed—but unmeasurable—value of the expansion factor at time of absorption. But since a photon's wavelength is inversely proportional to its energy, ν, then wavelength expansion means energy lost during a photon's transit.

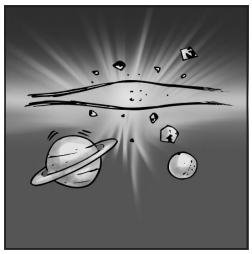
This leads us to consider the magnitude of the nonconservation-of-energy loss of CBR photons as in theory they were expansion-redshifted from 3000K at decoupling to the present 2.7K. Assuming a nominal universe volume, V_{univ} of 15 billion ly radius, the 2.7K CBR having about $\bar{n} = 410$ photons-cm^{-3} with average energy of about $\varepsilon_{2.7} = 10^{-15}$ erg, and the 3000K radiation with $\varepsilon_{3000} = 1.13 \times 10^{-12}$ erg, and an equal number of photons,[18] we compute the total CBR expansion energy loss as $E_{exp} = \bar{n} \times (\varepsilon_{3000} - \varepsilon_{2.7}) \times V_{univ} = 5.5 \times 10^{75}$ erg. This is about three times the galactic mass of a universe composed of 10^{21} solar masses. For an initial fireball temperature of 3 million K, the total radiation energy loss would be three thousand times the mass of such a universe. Even more incredibly, since in theory photon conservation extends back to a fireball temperature of 30 billion K, in this case the theorized nonconservation-of-energy loss projects to be thirty million times the mass of such a universe. These gargantuan energy losses command our attention. If they are real, then certainly it means that BBC's underlying premise of cosmic expansion is badly flawed, and hence BBC is a falsified theory.

Despite its fundamental importance, the mysterious thing about this expansion factor is that its value at any point in time is unknown. In fact, no one has ever proposed how it could be measured.

Even though Harrison did not report this energy loss calculation[19] (as David and I did in 1998),[20] we have proof it commanded his serious attention, as shown by comments in his book's second edition published in 2000. There we find him sending out the following SOS on this issue:

> The energy in the cosmic background radiation, once very large, is now quite small. Where has this energy gone? Can you think of an answer that conserves total energy? (The author has tried and failed.) Do you think that the second law of thermodynamics is a better conservation principle than the familiar conservation of energy principle?[21]

It is amazing that Harrison, one of the world's leading cosmologists, frankly admits to not only finding no solution to big bang's vast nonconservation-of-energy losses, but seeks answers from others far less qualified than himself, even from students, who surely must be mystified that a cosmologist of his stature would consider that any of them might think of a way to solve what has escaped a generation of cosmologists. After all, in their physics classes they are taught that energy is conserved. How could it be that in the big bang it is not conserved?



Exposing the Phantom Link Between Expansion Redshifts and Astronomical Redshifts

Now Pitts does not challenge the above nonconservation-of-energy loss calculation.[22] But he quotes others to the effect that these huge energy losses are compensated by energy gained by gravity. Even though it must be assumed that Harrison is familiar with all the papers cited by Pitts, he obviously had reasons for not discussing Pitts' argument as a valid solution. And, of course, I also have reasons which Harrison may not have been aware of. In particular, as I have previously shown, and will now show again even more explicitly herein, a number of gravitational redshift experiments of the interactions of gravity with photons prove there is no exchange of photon energy with the gravitational field.

To understand what follows necessitates we start with essential background information given by three of the world's eminent general relativity theorists, Misner, Thorne and Wheeler (hereafter MTW), in *Gravitation*,[23] the book that for decades has been considered the ultimate authority on the general relativistic basis of BBC. Figure 29.1 on page 776 shows BBC assumes GR expansion processes operate on wavelengths while photons are in-flight, but not at emission. What is so puzzling is that Pitts argues this is not the case. He quotes Andrew Repp as saying this is not a necessary condition because the emission/absorption process is so short that the wavelength would experience almost no change even if expansion does continue to operate during these periods.[24] Apparently both he and Repp fail to understand that the ultimate reason for cosmologists assuming cessation of expansion effects during emission/absorption is that they must do this in order to insure agreement with the astronomical requirement of a fixed standard emission wavelength, λ_s, in the standard expression used to calculate astronomical redshifts, which is $z = \lambda/\lambda_s - 1$. This failure then led Repp to argue for the physical reality of BBC's expansion redshifts when in fact, as now to be shown, neither he, nor Pitts, nor anyone else has ever verified their existence. Thus, in essence Repp's argument is only a repetition of BBC's mantra.

This brings us to the phantom link whose implications are never discussed in big bang cosmology—namely: If the expansion factor, $\Re$, is never measurable, then what meaning can the hypothesized equation $\lambda = \lambda_s (\Re/\Re_0)$ possibly have in the real world? What prediction could this equation possibly make about what the expanded wavelength should be at time of reception? The fact is that it does not make a prediction because it *cannot* make a prediction. The truth is that it is a phantom equation that cannot be tested.

Thus for big bang cosmology to even get off the ground, cosmologists had to invent some plausibility argument to link the imaginary effects of cosmic expansion with the real world, and then make it appear that this was a natural consequence of the theory. This they did by first assuming the universe was governed by the Friedmann-Lemaître expanding spacetime solution of the Einstein field equations and then *ex cathedra* pronouncing that cosmic expansion would cause galaxies to move apart as space itself was presumed to move apart. Hence that this expansion-induced motion of every galaxy away from every other galaxy would result in what they called cosmological redshifts. In this fictional scenario, astronomically determined redshifts of *nearby* galaxies were still to be interpreted in terms of the Doppler effect—true recession away from the observer. But for high redshifts, cosmological redshifts and something called the Hubble flow were invented to portray *distant* galaxies as uniformly moving apart, in which case the universe was said to be everywhere the same and everywhere moving apart.[25] In time this assumption of sameness was elevated and called the Cosmological Principle, when, in fact, there was no principle involved. Obviously, if experiments show the universe is not governed by Friedmann-Lemaître expanding spacetime general relativity, but instead by Einstein's static spacetime solution, wherein spatial volumes do not change in time, then it is impossible for cosmic expansion and cosmological redshifts to exist in our universe, which, of course, leads to the collapse of BBC. Before discussing the experiments which show this, we first analyze Pitts' attempts to reject BBC's nonconservation-of-energy losses.

This brings us to the phantom link whose implications are never discussed in big bang cosmology—namely: If the expansion factor, $\Re$, is never measurable, then what meaning can the hypothesized equation $\lambda = \lambda_s (\Re/\Re_0)$ possibly have in the real world?

Pinpointing Brian Pitts' Three Failed Attempts To Reject BBC's Nonconservation-of-Energy Losses

Two of Pitts' attempts to reject BBC's huge nonconservation-of-energy losses rely on lengthy General Relativity (GR) discussions concerning gravitation and the total energy content of the universe. Here he admits to be dealing with a "messy subject." This is borne out by his discussion. On one hand, he cites several GR authorities whose results support the concept of the universe's total energy being infinite. Then he cites other authorities in support of the total energy being zero. He admits not knowing which is true and is apparently not troubled by the possibility that this infinite difference may suggest a tremendous flaw in the underlying paradigms he uses to arrive at these results. Or at least he does not mention this possibility. Instead he says that whichever it is, nonconservation of energy is not a problem for BBC. If the total energy is zero, then not to worry; by definition it must remain zero. On the other hand, if it is infinite, then again not to worry because it will not make any difference how much energy is lost since you will still have an infinite amount left. I do not think these alternatives require much comment from me except to say that his proposed solutions are quite imaginative and beyond the scope of modern science to test them.

Pitts' other method of rejecting BBC's monumental nonconservation-of-energy losses, as given above, is again his reliance on the results of others. Like the other two just discussed, he does not really contest the above calculation. Instead he argues the cosmic energy lost would be energy gained by gravity, in which case energy is conserved. He recognizes this would require the interchange of photon energy with gravitational energy and references the work of Carlip and Scranton (C&S) to sustain this view. Here is what they say:

> Finally, let us briefly address one other issue raised in references 2 and 19 [in this paper notes 2 and 3], the problem of energy conservation in cosmological expansion. Gentry notes, correctly, that the electromagnetic energy of the cosmic microwave background is not conserved during expansion: in a volume expanding along with the universe, the radiation energy goes as $(1 + z)^{-1}$, and the redshift represents a genuine loss of photon energy. But there is nothing particularly "cosmological" about this loss—a photon rising in a static gravitational potential experiences a similar energy loss. In the laboratory, there is nothing mysterious about this phenomenon, which simply reflects the need to include gravitational potential energy in one's accounting. Indeed, energy conservation can be used to derive the redshift (see, for instance, section 7.2 of *Gravitation*, by Misner, Thorne and Wheeler [note 23 in this paper]).[26]

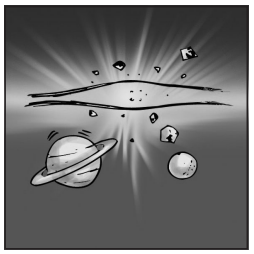
The above, first of all, affirms my claim that cosmic expansion, if it exists, does represent a genuine loss of photon energy. But C&S do not believe it represents nonconservation-of-energy. Instead they say this loss is compensated by energy exchange with gravity, and Pitts cites their result as being correct. But there are two big problems here. The first flaw in their reasoning, which Pitts obviously accepts, is their assumption that cosmic expansion does exist. They accept it in spite of the fact that I had already reported experimental evidence showing that it does not exist.[27] Secondly, they compare how cosmic expansion is presumed to work to expand wavelengths with how, in their view, photons lose energy rising in a static gravitational potential. The second big problem is that the same report that disproved the existence of cosmic expansion is also the one that showed there is no photon energy loss in that instance.[28] That is, I have already shown that comparison of atomic clock rates at two different altitudes, as per the operation of the GPS, provides conclusive experimental proof that no such interchange takes place. Now it is certain Pitts knows of this particular result because he cites this report in the general listing of a number of my papers in his abstract. But he signally fails to do so at this crucial point, thus leaving the distinctly erroneous impression that C&S's contention is correct. As the following analysis shows, however, it is not.

The Universe Is Governed by Einstein Static Spacetime General Relativity, Not the Expanding Spacetime Paradigm

When we examine the many relativistic gravitational experiments performed over the last few decades, we find that, while those results conflict with the expansion paradigm's basic assumptions, they are completely in accord with the predictions of the static-spacetime theory of general relativity as Einstein first proposed it in 1916. In that seminal paper, he predicted that gravity should cause a perfect clock to go

> more slowly if setup in the neighborhood of ponderable masses. From this it follows that the spectral lines of light reaching us from the surface of large stars must appear displaced towards the red end of the spectrum.[29]

In 1954 Brault's redshift measurement of the sodium D line emanating from the sun's spectrum did succeed in confirming the *magnitude* of the gravitational redshift that Einstein had predicted.[30] But this result did not settle the question of its *origin*. More specifically, was Einstein correct in postulating that different gravitational potentials at source and observer meant that clocks at these locations



On any rational basis, … BBC's underlying spacetime expansion premise must be fatally flawed … all the foregoing results show the universe we inhabit is one governed by Einstein's static-spacetime general relativity, and not by Friedmann-Lemaître's expanding-spacetime general relativity, which is the foundation of BBC.

should run at intrinsically different rates, and hence that this was the origin of the gravitational redshift? Or did the measured redshift instead have its origin in photons experiencing an in-flight energy exchange with gravity as they moved in a changing gravitational potential in their transit from a star to the Earth?

Even the 1964 Pound-Snider experiments did not settle this question.[31] True, these observers did find a $\Delta\nu/\nu = -\Delta\varphi/c^2 = gh/c^2$ fractional frequency difference between ^{57}Fe gammas emitted at the top and received at the bottom of a tower of height, h, separated by a gravitational potential difference, $\Delta\varphi$, and this result did more precisely confirm the *magnitude* of the Einstein redshift. But it did not settle its *origin*, for they could not tell whether the redshift resulted from in-flight wavelength change as the photon passed through a gravitational gradient, or whether it was due instead to differences in gravity affecting the relative frequency at the point of emission. They did suggest, however, this issue could be decided by comparing coherent light sources operating at different potentials.

As is now well known, atomic clock experiments have repeatedly shown that a clock on a mountain top does run faster than its sea level counterpart by a fractional amount $\Delta\nu/\nu = -\Delta\varphi/c^2 = gh/c^2$, which is exactly the same shift found by Pound and Snider. Although not generally recognized as such until now, this result proved long ago that the Einstein redshift is due to local gravity operating to affect relative emission frequencies as seen by an observer in a different gravitational potential. Moreover, the basic principle of local gravity affecting relative emission frequencies is further confirmed many thousands of times every hour in the continuing operation of GPS atomic clocks. Synchronization of those clocks utilizes the Einstein static-spacetime paradigm with its predicted effect of gravity on emission frequency to calculate how much faster satellite clocks will be expected to operate once they are in orbit. Thus, prior to launch, satellite clocks are preset to run about 38,400 ns/d slower than the base master clock to compensate for their faster rate in orbit.[32]

The reason this result is exceptionally important is that, as Carroll Alley noted in setting up the GPS, it proves there is only one redshift of the amount gh/c^2 detected between source and detector, and not two times this quantity. He relates this was a very great surprise to certain eminent general relativity theorists engaged in setting up the GPS.[33] Before the experimental results were in, they had strongly affirmed the detected shift would be two times gh/c^2. They so firmly believed there would be one redshift due to difference in clocks operating at a different potential, and another redshift due to photons changing energy (frequency) in transit, that they refused to believe otherwise until the experimental results absolutely proved there was no energy or frequency change as a photon transits a gravitational potential. Alley's experience shows there is a widespread misunderstanding of this critically important fact within the community of general relativity theorists, and it is doubtless this error that has led Pitts, and Carlip and Scranton,[34] and countless others to erroneously believe they have a sure foundation for expansion redshifts, whereas in fact GPS experiments prove this foundation is vacuous.

Another remarkable confirmation of gravity's effect on emission frequencies comes from Taylor's comparison of atomic clock time with pulsar timing data. To synchronize both data sets he found it necessary to account for the change of local atomic clock time due to the monthly variation in the sun's gravitational potential at Earth. In Taylor's own words:

> Here is direct proof, based on a clock some 15,000 light years from the solar system, that clocks on Earth run more slowly when the moon is full—because at this time of the month we are deeper in the gravitational potential of the sun!"[35]

Thus Einstein's 1916 predictions about both the origin and the magnitude of the gravitational redshift have been confirmed by a variety of general relativistic experiments, so as to obtain the following conclusions: (1) The Pound-Snider results show there is only one gravitational redshift between two points at different potentials, and it is given by $\Delta\nu/\nu = -\Delta\lambda\lambda = -\Delta\varphi/c^2$, and (2) this redshift does not originate with photons exchanging energy with gravity during transit through a potential gradient, but

instead originates in precisely the way that Einstein stated it in 1916, and again in 1952—namely, "An atom absorbs or emits light of a frequency which is dependent on the potential of the gravitational field in which it is situated."[36] This is further confirmed by Vera's theoretical work showing there is no exchange between gravity and photon energy.[37]

There are two very significant conclusions which can be drawn from the foregoing results, and they complement each other. One is that this result disproves Carlip and Scranton's assertion that cosmic energy loss could be compensated by exchange with gravity, thus proving that if cosmic expansion had existed at all, it would—as the above calculations show—result in a nonconservation-of-energy loss equivalent to over thirty million times the mass of the visible universe. On any rational basis, this means BBC's underlying spacetime expansion premise must be fatally flawed. And this indeed is the second conclusion to be drawn because all the foregoing results show the universe we inhabit is one governed by Einstein's static-spacetime general relativity, and not by Friedmann-Lemaître's expanding-spacetime general relativity, which is the foundation of BBC. And there is more.

Additional Disproof of BBC and the Emergence of a New Cosmic Center Universe Model

One of BBC's greatest presumed triumphs is the idea that the 2.7K CBR is relic radiation from the big bang fireball. In theory, cosmic expansion effects caused exceedingly high energy photons in the fireball to diminish in energy to become those now present in the CBR. However, we have already seen that the universe is not governed by Friedmann-Lemaître expansion; so it is impossible for this scenario to be correct. Nevertheless the question arises as to how can it be that BBC's temperature prediction is supposedly exactly the experimentally observed 2.7K. The answer is that it is not. I have discovered this prediction is based on a badly flawed equation. And when that flaw is corrected, it turns out that cosmic expansion's presumed effects on photon wavelength expansion lead to a predicted CBR temperature that is hundreds of millions of times less than the experimentally observed 2.7K. The details of this discovery now follow.

We seek to compare the local CBR temperature with cosmic expansion's prediction. In theory any CBR photon emitted with standard wavelength, λ_s, has since expanded so as to now exhibit a presently measurable wavelength, λ, given by[38]

$$\lambda/\lambda_s = 1 + z = (?)\ \Re/\Re_e \qquad (1)$$

where z is the present expansion redshift, and $\Re$ and $\Re_e$ are, respectively, the expansion factors at present time, t, and at time of photon emission, t_e. We remember that in the above $\lambda/\lambda_s = 1 + z$ is the standard astronomical redshift. The question mark emphasizes that BBC's only attachment to the real world is via the ad hoc practice of interpreting astronomically observed redshifts, $z_{obs} = \lambda/\lambda_s - 1$ in Equation (1), with the mythical cosmological redshifts, $z_{cos} = \Re/\Re_e - 1$. Because the expansion rate is presumed to be diminishing, the question arises whether long-term redshift monitoring of light from a distant source might provide evidence of this presumed change. Indeed, on page 451 of his text Weinberg focuses attention on this question[39] and Peacock likewise focuses on it in his Problem 3.2, the first part of which reads as follows:

> An object is observed at redshift z in a Friedmann universe with density parameter Ω. Calculate the observed rate of change of redshift of the object .[40]

Now *one method* of calculating expansion's present rate of change of λ, both for photons from galaxies or in the CBR, uses Equation (1) together with MTW's assumption[41] of the *temporal constancy* of λ_s and $\Re_e$, to obtain $(d\lambda/dt)/\lambda = (d\Re/dt)/\Re = H$ (the Hubble constant, see note 13), or

$$d\lambda_{appx}/dt = H\lambda = H(1 + z)\lambda_s \qquad (2)$$

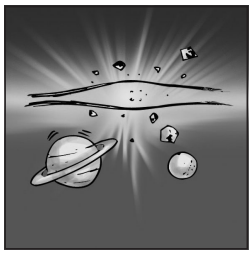
which agrees with the result obtained by Peebles.[42] The subscript in the above appears because Equation (2) is only an *approximation* due to the fact that it does not account for the *temporal variation* of $\Re_e$ at time of emission. The *correct expression* for $(d\lambda/dt)$ is obtained using results from Weinberg[43] and Peacock[44] of the exact expression for $\dot{z}$ from Equation (1). Both correctly include the *temporal variation* of $\Re_e$, $d\Re_e/dt_e$, when taking its time derivative,

$$\dot{z} = dz/dt = [\Re_e\ (d\Re/dt) - \Re(d\Re_e/dt_e)\ (dt_e/dt)]/\Re_e^2 \qquad (3)$$

In this instance dt and dt_e refer to differential time increments at present and at time of emission, respectively. Both Weinberg[45] and Peacock[46] find $dt_e/dt = \Re_e/\Re$, so the foregoing can be rewritten as

$$\dot{z} = [(\Re/\Re_e)\ ((d\Re/dt)/\Re) - ((d\Re_e/dt_e)/\Re_e)] = (1 + z)\ H - H_e \qquad (4)$$

which, except for different notation, is equivalent to Equation 14.6.23 in Weinberg's text,[47] and that obtained in Problem 3.2 on p. 618 in Peacock's text.[48] In both instances their calculations stop with the expression for $\dot{z}$, and neither comment about any unusual implications of their equivalents to Equation (4). Here, however, we continue the calculation to find the exact expression for $(d\lambda/dt)$. To do this we first remember that astronomical redshift determinations of distant galaxies are always obtained from Equation (1) on the premise that λ_s represents the exact laboratory emission line value corresponding to λ, the present astronomically measured, redshifted wavelength. It follows that λ_s is a constant for all times—which again disproves Repp's assertion[49] to the contrary—and hence that Equation (1) leads to $\dot{z} = (d\lambda/dt)/\lambda_s$. Equating this



This discovery again proves spacetime expansion and big bang's expansion redshifts are nonexistent mythical constructs in the universe we inhabit. In turn this means big bang's explanations of the Hubble redshift-distance relation, and the 2.7K Cosmic Blackbody Radiation (CBR) as relic radiation from big bang's fireball, are nothing more than science fiction.

quantity with the last expression in Equation (4) leads to

$$(d\lambda/dt) = \lambda_s [(1 + z)H - H_e] = \lambda H - \lambda_s H_e \quad (5)$$

where λ represents, as earlier stated, the observed *present rate of wave length change* of photons that were emitted from some source with wavelength λ_s at $H_e = (d\Re_e/dt_e)/\Re_e$, and time, t_e, as measured after the big bang at $t = 0$. Thus Equation (5) is a prediction of BBC that applies to either a stream of photons emitted from a distant galaxy, or to those in the CBR, that BBC presumes originated at its fireball. But since BBC does not provide any data on H, then it is not possible to directly test BBC using Equation (5) in its present form. However, if we apply the expanding universe condition, $(d\lambda/dt) > 0$ to this equation, we discover some truly amazing and very definitive predictions about the values of the photons' redshift expected to exist at present.

By remembering that Peacock's problem deals with a Friedmann universe, we first impose on Equation (5) the condition $H \sim t^{-1}$ for various Friedmann models.[50] This leads to the conclusion that local redshift measurements of photons, either from galactic sources or the CBR, must obey the redshift condition, $1 + z > H_e/H = t/t_e$. If we let $t = t_e + \Delta t$, where Δt is the elapsed time from photon emission to the present, we find

$$z > \Delta t/t_e \quad (6)$$

which is expansion's prediction of the minimum redshift to be expected from the measurement of any arbitrary group of photons emitted with the same standard laboratory wavelength, λ_s, and having a common origin at time t_e. Its unusual implications begin to be evident when it is applied to photons arriving from sources with $z > 6$. But its most extraordinary implications are even more evident when applying it to photons in the CBR.

For example, if we apply Equation (6) to the big bang's presumed fireball photons at time $t_e = 1$ s, when the radiation temperature of its primordial photons is theorized to be $\sim 10^{10}$ K, we find the elapsed time from then to the presumed time of decoupling, when the redshift is theorized to be $z = 1089$,[51] is only $\Delta t \sim 1000$ s, or less than half an hour. This value sharply contradicts the presumed 3.8×10^5 year value recently reported by Bennett.[52]

We can also use Equation (6) to find the expected present value of the CBR temperature by utilizing the most recent estimate[53] of the big bang at $t = 13.7 \times 10^9$ yr. On that basis, $\Delta t \simeq 5 \times 10^{17}$ s. Thus it follows that when the dynamic variation of $\Re_e$ is correctly included into the calculation of expansion's effect on CBR photons, then from the expressions $z > \Delta t/t_e$ and $T_{CBR} = 10^{10}/t^{½}$—where in this instance t is measured in seconds from the big bang[54]—we find the present CBR expansion redshift and CBR temperature are predicted to be $z_{exp} > 5 \times 10^{17}$ and $T_{CBR} < 2 \times 10^{-8}$ K, respectively. This is a factor of one hundred million less than the experimental 2.73K. Even if we just apply Equation (6) to the usual scenario where the CBR temperature is predicted to be ~ 3000 K at decoupling when $t_e = 3.8 \times 10^5$ yr., we still find predictions of $z_{exp} > 36000$ and $T_{CBR} < 0.08$ K.

Obviously, both sets of predictions are severely contradicted by the presently observed 2.73 K. Thus, instead of present CBR observations confirming the most important predictions of big bang cosmology, we find they contradict them. It proves there must be a major flaw in big bang's underlying postulate, which is the assumption that the universe is governed by the Friedmann-Lemaître solution of the field equations. Even more evidence of the very serious nature of this flaw comes from noticing the extraordinary implications of Equation (5). It reveals that the present rate of expansion-induced wavelength change of any photon depends on both the present value of the Hubble constant, H, and its value at time of emission, H_e. If this were true, then photons in the CBR must have retained a memory of the value of H_e at emission 13.7×10^9 years ago, and moreover, in some unknown way, must now be able to process that memory on an instantaneous basis throughout the universe in order for Equation (5) to hold. The idea of photons having a memory of the Hubble value at emission is bizarre and in contradiction to all of modern quantum electrodynamics.

This discovery again proves spacetime expansion and big bang's expansion redshifts are mythical constructs in the universe we inhabit. In turn this means big bang's explanations of the Hubble redshift-distance relation, and the 2.7K CBR as relic radiation from big bang's fireball, are nothing more

than science fiction. This result is a disaster of unimaginable proportions, for it destroys decades of seemingly triumphal efforts cosmologists put into showcasing the big bang as a real event because its relic radiation was identifiable as the 2.7K CBR. This particular disproof of big bang's Friedmann-Lemaître paradigm and its expansion redshifts removes the linchpin supporting big bang cosmology and the Cosmological Principle (CP), thus showing that spherical symmetry of the cosmos demanded by the Hubble redshift relation can no longer be attributed to the universe being the same everywhere. The CP is fallacious. Instead of the universe being both homogeneous and isotropic, it is only isotropic about a nearby universal Center. As note 13 explains, BBC's apparent success in explaining the Hubble relation was, ironically, because in practice cosmologists and astronomers actually employed the CCU framework to explain the Hubble redshifts. That is why big bang's fatal flaws went unnoticed for so many decades. Thus a new model of the cosmos is needed, one not indebted to the Friedmann-Lemaître paradigm and its expansion redshifts, but one based on observational evidence of a nearby Center, which can also account for the z = 3.91 BAL quasar with its high Fe/O ratio.[55] A new Cosmic Center Universe model—an upgraded version of the NRI model[56]—has already been developed. It reproduces eight of BBC's major predictions and for that reason alone deserves close scientific inspection because I have already responded to five categories of objections that were lodged against the earlier version of this model.[57]

This model may also be of interest to the Christian scientific community, for I have already suggested this nearby Center may be none other than the throne of God described in Hebrews 8–10 and Revelation 4 and 20. Hebrews 10 in particular describes the ministry of Christ as our great high Priest officiating his blood in behalf of sinners on the throne of the universe in the heavenly Sanctuary. It is on this basis that I suggest the spherical symmetry of the universe as seen from our point of observation is not a cosmic accident,[58] but instead a direct result of God not only creating the visible universe on the literal Day 4 of creation week,[59] but of doing it so as to provide unambiguous astronomical proof that a nearby universal Center does exist, with the logical deduction that he intends for Earth's inhabitants to reflect strongly on this fact as evidence that he is both Creator and Ruler of the Universe and Author of the Ten Commandments (Exod. 20:1–17). ◈

Notes

[1]J. Brian Pitts, "Has Robert Gentry Refuted Big Bang Cosmology? On Energy Conservation and Expansion," *Perspectives on Science and Christian Faith* 56, no. 4 (December 2004): 260–5.

[2]Robert V. Gentry, "Discovery of a Major Contradiction in Big Bang Cosmology Points to the New Cosmic Center Universe Model," http://cdsweb.cern.ch/search.py?recid=6126488. These results mean that all theories of the cosmos that depend on spacetime expansion, whether evolutionary or creationist, are just as badly flawed as the big bang theory.

[3]Ibid.; and Robert V. Gentry and David W. Gentry, "The Genuine Cosmic Rosetta," www.arxiv.org/abs/gr qc/9806061.

[4]Gentry, "Discovery of a Major Contradiction in Big Bang Cosmology."

[5]Robert V. Gentry, "New Cosmic Center Universe Model Matches Eight of Big Bang's Major Predictions without the F-L Paradigm," http://cdsweb.cern.ch/search.py?recid=6126498.

[6]Gentry, "Discovery of a Major Contradiction in Big Bang Cosmology"; and Gentry and Gentry, "The Genuine Cosmic Rosetta"; and Gentry, "New Cosmic Center Universe Model."

[7]Gentry and Gentry, "The Genuine Cosmic Rosetta."

[8]Gentry, "Discovery of a Major Contradiction in Big Bang Cosmology"; and Gentry and Gentry, "The Genuine Cosmic Rosetta."

[9]Gentry, "Discovery of a Major Contradiction in Big Bang Cosmology."

[10]Ibid.

[11]Ibid.

[12]Gentry, "New Cosmic Center Universe Model"; and ——, www.orionfdn.org/PosterSession/TenDocuments.htm, "Flaws in the Big Bang Point to GENESIS, A New Millennium Model of the Cosmos" (28 February 2001). On this date LANL staff removed these ten papers from the eprint arXiv. Since then LANL, NSF and Cornell Univ. have conspired to continue to prevent their release. See www.orionfdn.org for details.

[13]Gentry, "New Cosmic Center Universe Model." The CCU model accounts for, explains, or predicts a $T(z) = 2.73\,(1+z)$ K relation, velocity dipole distribution of radiogalaxies, the $(1+z)^{-1}$ dilation of SNe Ia light curves, the S-Z thermal effect, Olber's paradox, a $\sim(1+z)^{-3.56}$ modified Tolman relation, SN dimming for $z<1$, and brightening for $z>1$, extreme redshift ($z>10$) objects > BBC predictions, visible universe galaxies with high-Z element abundances independent of z, quasar redshift peaks with different $z_i \pm \Delta z_i$ intervals, a well-defined Hubble constant, $H=\sqrt{(4\pi G(2\rho_v - \rho)/3)}$, where ρ_v and ρ are vacuum and ordinary mass densities, galaxies receding from C at distances r with velocities v=dr/dt due to vacuum gravity repulsion and redshifts given by $1+z = (1+Hr/c)/\sqrt{(1-2(Hr/c)^2)}$, where $H = v/r = (dr/dt)/r$. Thus, whereas in theory, BBC cosmologists claimed to believe in their mythical $H=(d\Re/dt)/\Re$ expression, in practice they mimicked my CCU model and envisioned galaxies receding with v= Hr from our location, which is near the Center. Ironically then, they actually employed the CCU model to explain the Hubble redshifts, and that is why the big bang was able to impersonate the truth as long as it did.

[14]Robert V. Gentry, See Reports section of www.halos.com for my reports in *Science, Nature, Geophysical Research Letters, Annual Reviews of Nuclear Science* and *Physical Review Letters,* or the Appendix of my book *Creation's Tiny Mystery,* as described on the same website.

[15]E. R. Harrison, *Cosmology: Science of the Universe,* 1st ed. (Cambridge University Press, 1981) 275–6; and ibid., 2d ed. (Cambridge University Press, 2000), 363.

[16]Gentry and Gentry, "The Genuine Cosmic Rosetta."

[17]Harrison, *Cosmology: Science of the Universe.*

[18]Joseph Silk, *The Big Bang* (W. H. Freeman and Company, 1995), 417–29.

[19]Harrison, *Cosmology: Science of the Universe.*

[20]Gentry and Gentry, "The Genuine Cosmic Rosetta."

[21]Harrison, *Cosmology: Science of the Universe,* 363.

[22]Gentry and Gentry, "The Genuine Cosmic Rosetta."

[23]Charles W. Misner, Kip S. Thorne, and John A. Wheeler, *Gravitation* (W. H. Freeman and Co., 1973).

[24]Andrew S. Repp, "The Nature of Redshifts and an Argument by Gentry," *Creation Research Society Quarterly* 39 (2002): 269; http://creationresearch.org/crsq/articles/39/39_4/Redshifts.pdf.

[25]Gentry and Gentry, "The Genuine Cosmic Rosetta"; Silk, *The Big Bang;* and Misner, Thorne, and Wheeler, *Gravitation.*

[26]Steve Carlip and Ryan Scranton, "Remarks on the 'New Redshift Interpretation,'" *Modern Physics Letters A*14 (1999): 71; www.arxiv.org/abs/astro-ph/9808021, v.2 (January 5, 1999).

[27]Gentry and Gentry, "The Genuine Cosmic Rosetta."

[28]Ibid.
[29]A. Einstein, "Die Grundlage der allgemeinen Relativitatstheorie," *Ann. der Physik* 49 (1916): 756. English reprint in *The Principle of Relativity* (Dover Publications), 111–64; See also *Relativity: The Special and General Theory* (New York: Crown Trade Paperbacks), 130.
[30]J. W. Brault, Abstract, "Gravitational Redshift of Solar Lines," in *Bulletin of the American Physical Society* 8 (1963): 28.
[31]R. V. Pound and J. L. Snider, "Effect of Gravity on Nuclear Resonance," *Physical Review Letters* 13 (1964): 539–40.
[32]C. O. Alley, "Proper Time Experiments in Gravitational Fields with Atomic Clocks, Aircraft, and Laser Light Pulses," in *Quantum Optics, Experimental Gravity, and Measurement Theory*, ed. P. Meystre and M. O. Scully (New York: Plenum Press, 1981), 343–424.
[33]Ibid. Alley writes:

> A common mistake in dealing with relativistic time was also made by one of the Air Force contractors in relation to the GPS. This is the notion that electromagnetic radiation changes frequency (or a photon changes energy) as it propagates through a gravitational potential difference. If the physical clock adjustments have been made as described above so that all clocks are keeping a common coordinate time, then there is no effect on the frequency of radiation as measured in that coordinate time. However, the contractor had included in the computer program to operate the system just such a correction, effectively correcting twice for the relativistic effects. Actual experience with test GPS equipment in orbit was required to persuade some engineers of their error.
>
> We should not be surprised at such lack of understanding of some fundamental concepts of General Relativity since the subject is almost never taught to engineers and rarely even to physicists. Also, confusion about these concepts is not restricted to engineers and others who must deal with ultra-stable clocks, but is widespread even among eminent physicists.
>
> Consider the following excerpts from *Relativity Re-examined* by Leon Brillouin (Academic Press, 1970): "… All the clocks at rest in our inertial frame will give the same frequency definition with or without gravity potential. The gravity shift is only due to the motion of the photons" (Brillouin, pp. 83–4).
>
> Our [Alley referring to his] experiments clearly contradict this statement. To his credit, at another place in the book, he wrote: "… [improved atomic clocks] would allow us to perform many important experiments that would tell us definitely what to think of relativity!" (Brillouin, p. 40).
>
> If Professor Brillouin were still living, perhaps he would accept our [Alley referring to his] experiments as convincing evidence for the correctness of Einstein's views on time (Alley, p. 424).

[34]Carlip and Scranton, "Remarks on the 'New Redshift Interpretation.'"
[35]J. H. Taylor, "Astronomical and Space Experiments to Test Relativity," in *General Relativity and Gravitation* (Cambridge University Press, 1987), 214.
[36]Einstein, *Relativity: The Special and General Theory,* 130.
[37]Rafael A. Vera, "A Dilemma in the Physics of Gravitational Fields," *International Journal of Theoretical Physics* 2, no. 1 (1981): 19.
[38]Silk, *The Big Bang.*
[39]Steven Weinberg, *Gravitation & Cosmology* (John Wiley & Sons, 1973), 451.
[40]John Peacock, *Cosmological Physics* (Cambridge University Press, 1999), 99.
[41]Misner, Thorne, and Wheeler, *Gravitation.*
[42]P. J. E. Peebles, *Principles of Physical Cosmology* (Princeton: Princeton University, 1993), 95.
[43]Weinberg, *Gravitation & Cosmology.*
[44]Peacock, *Cosmological Physics.*
[45]Weinberg, *Gravitation & Cosmology.*
[46]Peacock, *Cosmological Physics.*
[47]Weinberg, *Gravitation & Cosmology.*
[48]Peacock, *Cosmological Physics.*
[49]Repp, "The Nature of Redshifts and an Argument by Gentry."
[50]Silk, *The Big Bang.*
[51]Ibid.
[52]C. L. Bennett, et al., "First Year Wilkinson Anisotropy Probe (WMAP) Observations: Preliminary Maps and Basic Results," www.arxiv.org/abs/astro-ph/0302207.
[53]Ibid.
[54]Silk, *The Big Bang.*
[55]G. Haisinger, G. Schartel, S. Komasa, "Discovery of an ionized Fe-K edge in the **z=3.91** Broad Absorption Line Quasar APM 08279?5255 with XMM-Newton," *Astrophysics Journal* L77 (2002): 573. See note 2 for details why this quasar directly contradicts BBC's scenario for the properties of high redshift quasars.
[56]Robert V. Gentry, "A New Redshift Interpretation," *Modern Physics Letters A* 12 (1997): 2919; www.arxiv.org/abs/astro-ph/9806280.
[57]Robert V. Gentry, "New Cosmic Center Universe Model Matches Eight of Big Bang's Major Predictions without the F-L Paradigm." My earlier model, first presented at the 1982 Santa Barbara AAAS meeting, also involved a nearby universal Center. It is described in "Radiohalos in a Radiochronological and Cosmological Perspective," *Proceeding of the 63rd Annual Meeting of the Pacific Division, American Association for the Advancement of Science* 1, Part 3 (1984): 38, which is reprinted on pages 267–95 of the 4th ed. of my book, *Creation's Tiny Mystery* (see www.halos.com).
[58]Robert V. Gentry, "Election Implications of Censorship of Disproof of Big Bang Cosmology (BBC)," *Bulletin of American Physical Society* 49 (2004): 163. Depending on reader interest, I may yet post on www.orionfdn.org, proof of referee and editorial bias at the highest echelons of *Physical Review Letters* and other journals in suppressing publication of the discoveries described herein.
[59]I assume some readers will be interested in learning a few more details about how I reconcile my faith with science. I believe the Bible teaches God created all of the visible universe, including Earth and all its life forms during the six literal days described in Genesis and affirmed in Exod. 20:8–11, and that creation week occurred only about 6,000 years ago. Evidence for Earth's recent creation is given in my book at www.halos.com. The other question concerns how light from the most distant objects in the visible universe—about 14 billion light years in my new Cosmic Center Universe model—could have been seen by Adam and Eve on Day 6. I believe the record of glory coming from the Father to Christ on the Mount of Transfiguration, as recorded in 2 Peter 1:16–18, and Paul's record of Stephen gazing into heaven and seeing Christ standing at the right hand of the Father, as recorded in Acts 7:54–56, shows conclusively that the transit time of light from God's throne—which I believe is at the universal Center within the Galaxy—was exceedingly brief so as to accomplish the purpose at hand. Likewise I believe God utilized a similar physical process both during creation week and continuing thereafter to enormously reduce the transit time of light from distant celestial objects, so much so that I believe that light is arriving within a relatively short time after emission, even from the most distant reaches of the visible universe. This means we are seeing the universe almost in real time. I suggest radial changes in vacuum properties may cause light to tunnel rapidly from distant points to Earth. Alpha particle tunneling through the nuclear potential barrier is well known. The differences in time of arrival of light from different images of lensed quasars do not contradict this because the delays that are observed are differences in transit time, not a measure of the transit time itself. Lastly I believe the outer galactic shell, described in my CCU model as circumscribing the visible universe, is referenced in the Bible as the ancient heavens (Ps. 68:32, 33; RSV and NASB), which I believe are the result of a significantly earlier creation that also included angels as well as many worlds in those outer galaxies that were, like Earth, created to be inhabited by unfallen intelligent beings. The latter I associate with the sons of God referred to in Job 1:6 and 2:1. The fact that galaxies in the CUC model are physically receding from the nearby Center agrees with a universe that is described as being stretched out at creation (Isa. 40:22; 45:12 and 51:13). More details will be given later.