

Chapter 5

How can we see distant stars in a young universe?

- If the universe is young and it takes millions of years for light to get to us from many stars, how can we see them?
- Did God create light in transit?
- Was the speed of light faster in the past?
- Does this have anything to do with the 'big bang'?
- Is there evidence that Earth is a privileged planet?
- What about Relativity?

SOME galaxies are billions of light-years away. Since a light-year is the distance travelled by light in one year, and we can see such galaxies, does this mean that the universe is very old?

Despite all the biblical and scientific evidence for a young earth/universe (see *Evidences for a Young Earth*, in this booklet series),¹ this has long been a seemingly intractable problem. However, any scientific understanding of origins will always have opportunities

1. See also: Young age evidence; <creation.com/young>

for research—problems that need to be solved. We can never have complete knowledge and so there will always be things to learn.

The big bang light travel problem

It's important to note that the most widely held cosmology, the standard secular big bang theory has a problem of its own with light travel, called the *horizon problem*. This arises from the universe being thought to be at least ten times bigger than the distance that radiation ('light') could have travelled since the big bang, even with their billions of years timescale.

According to the big bang the universe began in a fireball from which all matter in the universe is ultimately derived. For galaxies to have any hope of forming at all during the expansion process, the fireball must have begun with an uneven distribution of temperatures. However, we see radiation coming from the cosmos, in all directions on the sky and it is very uniformly distributed, wherever we look. This is the cosmic microwave background (CMB) radiation and it has been measured to be uniform to one part in 100,000. But, how could this be so if the radiation has not had sufficient time to traverse the greatest distances in the universe so that it could even out the temperature by transmitting energy from hot regions to cold?

This problem gave rise to hypothetical fudge factors such as faster-than-light 'inflation' being added to the big bang, but there is no known mechanism to start or stop the process in a smooth fashion (it is effectively a naturalistic 'miracle'). Other big bang cosmologists have even suggested that the speed of light (radiation) may have been



Photo by NASA

much faster in the past.² So no one can rightly claim this issue as a reason not to believe the Bible, because the standard secular big bang cosmology has a similar problem.³

Created light?

A few decades ago, perhaps the most commonly used explanation was that God created the light ‘on its way’, so that Adam could see the stars immediately without having to wait years for the light from even the closest ones to reach the Earth. While we should not limit the power of God, this has some immense difficulties.

It would mean that whenever we look at the behaviour of a very distant object, what we apparently see happening never really happened at all. For instance, say we see an object a million light-years away which appears to be rotating; that is, the light we receive in our telescopes carries this information, ‘recording’ this behaviour. However, according to the ‘created in transit’ explanation, the light we are now receiving did not come from the star, but was created ‘en route’.

This would mean, for a (say) 10,000-year-old universe, that anything we see happening beyond about 10,000 light-years is actually part of a gigantic picture-show of things that have not actually happened, showing us objects which may not even exist.

To explain this problem further, consider an exploding star (supernova) at, say, an accurately measured distance of 100,000 light-years. Remember we are using this explanation in a 10,000-year-old universe. As the astronomer on Earth watches this exploding star, he is not just receiving a beam of light. If that were all, then it would be no problem at all to say that God could have created a whole chain of photons (light particles) already on their way. However, what the astronomer receives is also a particular, very specific pattern of variation within the light, showing the changes that one would expect to accompany such an explosion—a predictable sequence of events involving neutrinos, visible light, X rays and gamma-rays. For example, because most neutrinos pass through solid matter as if it were not there, while light is slowed down, we can detect a massive

2. Wieland, C., 2002. Speed of light slowing down after all? *Journal of Creation* **16**(3):7–10; <creation.com/cdk>

3. Lisle, J., 2003. Light-travel time: a problem for the big bang. *Creation* **25**(4):48–49; <creation.com/lighttravel>

neutrino burst before the light reaches us.

The light and neutrino burst carries information recording an *apparently real event*. The astronomer is perfectly justified in interpreting this ‘message’ as representing actual reality—that there really was such an object, which exploded according to the laws of physics, brightened, emitted X-rays, dimmed, and so on, all in accord with those same physical laws.

Everything the astronomer sees is consistent with this, including the spectral patterns in the light from the star giving us a ‘chemical signature’ of the elements contained in it. Yet the ‘light created *en route*’ explanation means that this recorded message of events, transmitted through space, had to be contained within the light beam from the moment of its creation, or planted into the light beam at a later date, without ever having originated from that distant point. (If it had started from the star—assuming that there really was such a star—the light beam would still be 90,000 light years away from Earth, assuming the universe is 10,000 years old and the speed of light constant.)

To create such a detailed series of signals in light beams reaching Earth, signals which seem to have come from a series of real events but in fact did not, has no conceivable purpose. Worse, it is like saying that God created fossils in rocks to fool us, or even test our faith, and that they don’t represent anything real (a real animal or plant that lived and died in the past). This would be a strange deception for a holy God to engage in.

Did light always travel at the same speed?

An obvious solution would seem to be a higher speed of light in the past, allowing the light to cover the same distance in less time. This seems at first glance a too-convenient *ad hoc* explanation. Some years ago, Barry Setterfield raised such a possibility to a high profile by showing that there seemed to be a decreasing trend in the historical observations of the speed of light (c) over the past 300 years or so. Setterfield (and his later co-author, Trevor Norman) produced evidence in favour of their ‘cdk’ theory.⁴ They believed that it would have affected radiometric dating results, and even have caused the

4. Norman, T.G. and Setterfield, B., 1990. *The atomic constants, light and time*. Privately published, 88 pp.8.

red-shifting of light from distant galaxies, although this idea was later overturned, and other modifications were made also.

Many attacked the idea on the fallacious grounds that Einstein's special relativity said that the speed of light could not change. It actually just says that the speed of light measured by observers will be invariant regardless of the speed of the source or observer.

Much debate raged to and fro among equally capable people within creationist circles about whether the statistical evidence really supported cdk or not.

The biggest difficulty, however, is with certain physical consequences of the theory. If c has declined the way Setterfield proposed, these consequences should still be discernible in the light from distant galaxies, but they are apparently not. High precision tests of Einstein's theory of general relativity, in our galaxy, using co-orbiting pairs of neutron stars, where at least one is a pulsar, within thousands of light-years distance, indicate the same value for c as we measure locally.⁵ In short, none of the theory's defenders have been able to answer all the problems raised. Interestingly, big bang defenders treated the idea of cdk with contempt, but then one of their own, João Magueijo, proposed a similar idea to rescue the big bang from its own light travel problem!

New creationist cosmologies

Nevertheless, the cdk theory stimulated much thinking about the issues. Creationist physicist Dr Russell Humphreys says that he spent a year, on and off, trying to get the cdk theory to work consistently, but without success. However, the thinking inspired him to develop ideas for a new creationist cosmology that appeared to solve the problem of the apparent conflict with the Bible's clear, authoritative teaching of a recent creation.⁶ This new cosmology was proposed as a creationist alternative to big bang theory.

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5. Creationist physicist Dr Keith Wanser pointed out that the rate of energy loss of a pulsar due to gravitational radiation is proportional to c , according to general relativity (*Radioactive Decay Update: Breaking Down the Old-Age Paradigm* (Video)). The 1993 Nobel Prize in Physics was awarded to Russell Hulse and Joseph Taylor for discovering a binary pulsar and showing that the observed energy loss matched the predictions of general relativity to within 0.4%. But this indicates that c hasn't changed in the thousands of years since light left that pulsar.
 6. Humphreys, D.R., 1998. New vistas of space-time rebut the critics. *Journal of Creation* 12(2):195-212 and see further discussion in *Journal of Creation* 13(1):49-62, 1999.13.

This sort of development, in which one creationist theory, cdk, is overtaken by another, is a healthy aspect of science. The basic biblical framework, because it comes from the Creator, is non-negotiable, as opposed to the changing views and models of fallible people seeking to understand the data within that framework (evolutionists also often change their ideas on exactly how things have made themselves, but never *whether* they did).

A clue

Let us briefly give a hint as to how the new cosmology seemed to solve the starlight problem. Consider that the time taken for something to travel a given distance is the distance divided by the speed it is travelling. That is,

$$\text{Time} = \text{Distance (divided by) Speed}$$

When this is applied to light from distant stars, the time calculates out to be billions of years. Some have sought to challenge the distances, but that is a very unlikely solution.⁷

Astronomers use many different methods to measure the distances, and no informed creationist astronomer would claim that errors would be so vast that billions of light years could be reduced to several thousand, for example. Even our own Milky Way galaxy is about 100,000 light years across!

If the speed of light (**c**) has not changed, the only thing left in the equation is time itself. In fact, Einstein's relativity theory has been telling the world for decades that time itself is not an absolute concept. Scientists may not know what time is but they do know how to measure it. Nowadays very precise and exact atomic clocks measure the rate or flow of time and it has been measured to vary from place to place.

In fact, two things have been observed to distort the flow of time—one is speed and the other is gravity. Einstein's general theory, the best theory of gravity we have at present, indicates that *gravity distorts time*.

This effect has been measured experimentally, many times. Clocks at the top of tall buildings, where gravity is slightly less,

7. Many billions of stars exist, many just like our own sun, according to the analysis of the light coming from them. Such numbers of stars have to be distributed through a huge volume of space, otherwise we would all be fried.

run slightly faster than those at the bottom, just as predicted by the equations of general relativity (GR).⁸

When the concentration of matter is very large, the gravitational distortion can be so immense that even light cannot escape.⁹ The equations of GR show that at the invisible boundary surrounding such a concentration of matter (called the event horizon, the point at which light rays trying to escape the enormous pull of gravity bend back on themselves), time literally stands still, as observed by a distant observer.

Using different assumptions ...

Dr Humphreys' new creationist cosmology 'falls out' of the equations of GR, so long as one assumes that the universe is bounded with a unique centre. In other words, that it has a centre and an edge. This means that if you were to travel into space, you would eventually come to a place beyond which there was no more matter. In this cosmology, Earth is near the centre, as it appears to be as we look out into space.

This might sound like common sense, as indeed it is, but all modern secular cosmologies deny this. That is, they make the *arbitrary* assumption (without any scientific necessity) that the universe has no boundary—no edge and no centre—dubbed the 'cosmological principle'. In this *assumed* universe, every galaxy would be surrounded by galaxies spread evenly in all directions and so therefore (on a large enough scale) all net gravitational forces cancel out.

This is a *philosophical* assumption; that is, religious. And it is made to remove Earth from its apparently privileged position near the centre of the Universe (because that's what the Bible implies; that Earth is the focus of God's attention in creating the universe). Note what respected cosmologist George Ellis says:

'People need to be aware that there is a range of models that could explain the observations,' Ellis argues. 'For instance, I can construct you a spherically symmetrical universe with Earth at its center, and you cannot disprove it based on observations.'

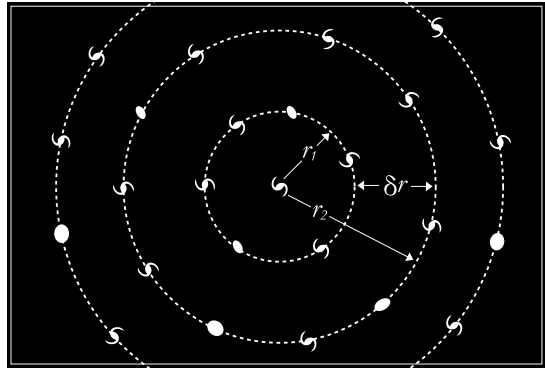
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8. The demonstrable usefulness of GR in the physics of time-keeping, for example, can be separated from certain 'philosophical baggage' that some have illegitimately attached to it, and to which some Christians have objected, thinking that such relativity in physics in some way supported *relative morality*.
9. Such an object is called a 'black hole'.

Ellis has published a paper on this. ‘You can only exclude it on philosophical grounds. In my view there is absolutely nothing wrong in that. What I want to bring into the open is the fact that we are using philosophical criteria in choosing our models. A lot of cosmology tries to hide that.’¹⁰

Not only can you have such an understanding of the universe, but it actually fits the evidence much better than the no-centre, boundless universe assumed by secularists. There is now powerful evidence that the universe has a centre. For example, the observed radiation from quasars is polarized in a given direction, galaxies have been shown to have a preferred direction of alignment and red-shifts of galaxies are quantized (in distinct groups) rather than random.¹¹ The quantized light from galaxies suggests that galaxies are organized in concentric shells of the order of a million light years apart, centred on our part of the universe. The probability of Earth being in this privileged position with a naturalistic (non-designed) origin of the universe is less than a trillion to one.¹²

These observations do not fit the materialists’ no-centre, unbounded randomly generated universe, but are consistent with a universe designed by a Creator.

The big bang has many other problems,^{13,14} so much so that even



Galaxies tend to be grouped in concentric spherical shells around our home galaxy. The distance interval between shells is of the order of a million light years. Such a pattern would not be observable if Earth was not near the centre of the Universe.

By Dr Russell Humphreys

10. Gibbs, W. W., 1995. Profile: George F. R. Ellis; *Thinking Globally, Acting Universally. Scientific American* 273(4):28–29.
11. See: Where is the centre of the universe? <creation.com/astronomy#centre>
12. Humphreys, D.R., 2002. Our galaxy is the centre of the universe, ‘quantized’ redshifts show. *Journal of Creation* 16(2):95–104; <creation.com/center>
13. Williams, A., and Hartnett, J., 2005. *Dismantling the big bang; God’s universe rediscovered.* Master Books.
14. See papers listed under: What are some of the problems with the big bang hypothesis? <creation.com/astronomy#big_bang>

many secularists are calling for a radical re-think:¹⁵

‘Big bang theory relies on a growing number of hypothetical entities—things that we have never observed. Inflation, dark matter and dark energy are the most prominent. Without them there would be fatal contradictions between the observations made by astronomers and the predictions of the big bang theory.’¹⁶

According to GR, if the universe has a boundary and centre, then there should be a net gravitational force toward the centre. Clocks at the edge should run faster than clocks on Earth, assuming Earth is near the centre. In other words, it is no longer enough to say God made the *universe* in six days. He certainly did, but six days as measured by which clocks? (If we say ‘God’s time’ we miss the point that He created the flow of time as we now experience it; He is outside of time, seeing the end from the beginning.)¹⁷

There appears to be observational evidence that the universe has expanded in the past, which is consistent with the many phrases God inspired the Bible writers with to tell us that at creation He ‘stretched out’¹⁸ (other verses say ‘spread out’) the heavens.

If the universe is not much bigger than we can observe, and if it was only 50 times smaller in the past than it is now, then scientific deduction based on GR means it has to have expanded out of a previous state in which it was surrounded by an event horizon (a condition known technically as a ‘white hole’—a black hole running in reverse, something permitted by the equations of GR).

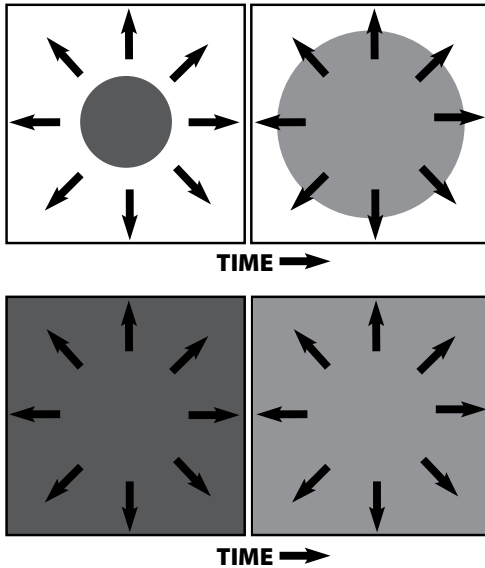
As matter passed out of this event horizon, according to Humphreys’ theory, the horizon itself had to shrink—eventually to nothing. Therefore at one point this horizon would have been touching the Earth. In that instant, time on the Earth (relative to a point far away from it) would have been virtually frozen. An observer on Earth would not in any way ‘feel different’. In principle ‘billions of years’ would be available for light to reach the Earth (in the frame of reference within which it is travelling in deep space), for stars to age, etc.—while less than an ordinary day passes on Earth. Humphreys

15. Wieland, C., 2005. Secular scientists blast the big bang. *Creation* 27(2):23–25; <creation.com/bigbangblast>

16. Eric Lerner and 33 other scientists from 10 different countries, 2004. Bucking the big bang. *New Scientist* 182(2448):20; <www.cosmologystatement.org>

17. Genesis 1:1; Ecclesiastes 3:11; Isaiah 26:4; Romans 1:20; 1 Timothy 1:17; Hebrews 11:3. Interestingly, according to GR, time does not exist without matter, as was discussed in the *Does God Exist?* booklet in this series.

18. For example, Isaiah 42:5; Jeremiah 10:12; Zechariah 12:1.



Expansion of a bounded (top) and an unbounded (bottom) universe.

suggested that massive gravitational time dilation would seem to be a scientific inevitability if a bounded universe has expanded significantly from a previously denser state.

In one sense, if observers on Earth at that particular time could have looked out and ‘seen’ the speed with which light was moving toward them out in space, it would have appeared as if it were travelling many times faster than c .

(Galaxies would also appear to be rotating faster.) However, if an observer in deep space was out there locally measuring the speed of light, he would still only measure c .

It is fortunate that creationists did not invent such concepts as gravitational time dilation, black and white holes, event horizons and so on, or we would likely be accused of manipulating the data, or fantasizing, to solve this problem. The interesting thing about Humphreys’ cosmology is that it is based upon mathematics and physics accepted by all cosmologists (general relativity), and it accepts (along with virtually all physicists) that there has been expansion in the past (though not from some imaginary dimensionless point). The results ‘fall out’ so long as one abandons the arbitrary starting point which big bangers use (the unbounded cosmos idea, which could be called ‘what the experts don’t tell you about the big bang’).

This cosmology seems to explain many of the observations used to support the big bang, without compromising the data or the biblical record of a young Earth.

New cosmology solves light-travel problem

All theories of fallible people, no matter how well they seem to fit the data, are subject to revision or abandonment in the light of future discoveries. The white hole cosmology discussed above does not provide the *correct amount* of time dilation, but it is certainly headed in the right direction with encouraging theoretical and observational support. Indeed, the observed anomalous acceleration (towards the sun) of distant *Pioneer* spacecraft is consistent with the essentials of several creationist cosmologies—a cosmic centre of mass, expansion of space, and recent time dilation.¹⁹ Big bang advocates have been unable to explain these observations.

Dr John Hartnett has taken these three concepts further and incorporated *cosmological relativity*. The latter is derived from the development of special relativity theory (the effect of motion on time) for the large scale structure of the universe. The concept was developed by Dr Moshe Carmeli, but Hartnett has shown that it can equally be applied to a universe with a centre of mass (as per Humphreys), and also explains the observations. It also shows how we can see distant starlight as a direct consequence of the way that God stretched out the universe during creation week.²⁰ The model involves the usual four dimensions (three of space, plus time) but adds a new fifth dimension, the velocity of the expansion of the cosmos, an analogue to the effect that velocity has on time in special relativity. Hartnett's model, for example, explains the structure of galaxies without resorting to unseen 'dark matter', a 'fudge' factor that the big bang model needs. He has published papers showing that Carmeli's fifth dimension ('metric') really works.

Time dilation also results, but not due to a net gravitational effect in a finite bounded universe—it is due to the enormous stretching of the fabric of space. Space is not nothing—there is a lot of energy in the vacuum and, at Creation, God caused space to rapidly expand such that clocks on Earth at the centre of the expansion ran very slowly compared to clocks in galaxies in the expanding cosmos.

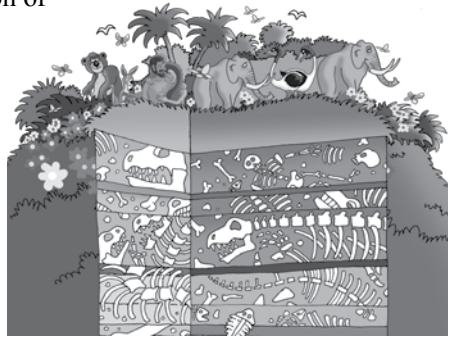
19. Humphreys, D.R., 2007. Creationist cosmologies explain the anomalous acceleration of Pioneer spacecraft. *Journal of Creation* **21**(2):61–70.

20. See Hartnett, J., 2007. A 5D spherically symmetric expanding universe is young. *Journal of Creation* **21**(1): 69–74 and papers at <creation.com/hartnett>. There is a good technical summary of this model at <http://creationwiki.org/Cosmological_relativity>.

Conclusion

What if no one had ever thought of the possibility of time dilation? Many might have felt forced to agree with those scientists (including some Christians) that there was *no* possible solution—the vast ages are a fact because we can see distant stars, and the Bible must be ‘reinterpreted’ (massaged) or increasingly rejected. Many have in fact been urging Christians to abandon the Bible’s clear teaching of a recent creation because of these ‘undeniable facts’.

However, this reinterpretation of Scripture would also mean that Earth is old and the rocks containing fossils under our feet are old. So this also entails (if it is logically thought through) accepting that there were billions of years of death, disease, and bloodshed before Adam, thus eroding the Creation/Fall/Restoration historical framework presented in the Bible²¹ —the framework in which the gospel makes sense, and upon which western civilisation has been built, with all its many benefits.²²



However, even without the new ideas that seem to solve the problem, such an approach would still have been wrong-headed. The authority of the Bible should never be compromised by mankind’s ‘scientific’ proposals. One little previously unknown fact, or one change in a starting assumption, can drastically alter the whole picture so that what was ‘fact’ is no longer so.

This is worth remembering when dealing with other areas of difficulty which, despite the substantial evidence for Genesis creation, still remain. Only God possesses infinite knowledge. By basing our scientific research on the assumption that His Word is true (instead of the assumption that it is wrong or irrelevant) our scientific theories are much more likely, in the long run, to come to accurately represent reality.

21. Batten, D.J., and Sarfati, J., 2006. *15 Reasons to take Genesis as history*. Creation Ministries International, Brisbane, Australia.

22. Williams, A., 2004. The biblical origins of science. *Journal of Creation (TJ)* 18(2):49–52; <creation.com/stark>