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## SEVEN YEARS OF *STARLIGHT AND TIME*



D. Russell Humphreys, Ph.D.\*

Seven years ago this month I sent Master Books the manuscript of a small book on creationist cosmology called *Starlight and Time*.<sup>1</sup> Without much publicity it has proved surprisingly popular, being well into its sixth printing and recently made into a video.<sup>2</sup> Apparently many Christians have been concerned about the problem suggested by the book's subtitle, *Solving the Puzzle of Distant Starlight in a Young Universe*. That is, if the cosmos is indeed as young as the Bible says it is, how could the light from very distant stars have had time to get here? Consequently,

the book has had quite an impact, both favorable and vitriolic.

A 1987 monograph by Australian creationist Barry Setterfield<sup>3</sup> had stimulated me to examine this problem. He suggested that the speed of light,  $c$ , was much faster in the past. His particular “ $c$ -decay” model turned out to have problems with both data and physics theory, problems I outlined in appendix A of my book. But he deserves credit for focusing creationist attention on cosmology and for setting the example of offering a very creative solution to the problem.

The monograph revived my interest in Einstein's general theory of relativity, which I had neglected since graduate school. Physicists like me often use Einstein's *special* theory of relativity dealing with the effects of high speeds and have found it indispensable. Few of us have occasion to use *general* relativity, which deals with effects of gravity and acceleration not easily attainable in the laboratory. But it is an essential tool for astrophysics and cosmology.

Until the last decade many young-earth creationists had avoided relativity, and consequently astrophysics and cosmology. The main reason was a dislike

\* Dr. Humphreys is a physicist at Sandia National Laboratories soon to retire and become an Associate Professor of Physics for ICR.

of some of the philosophical implications and logical paradoxes associated with the theory. However, I found that the bad philosophy and paradoxes come not from the mathematics of relativity itself, but rather from a bad *interpretation* of the mathematics. A better interpretation is possible which resolves the philosophical and logical problems as my book briefly explains.<sup>4</sup> I've been pleased to see that in recent years creationist scientists are no longer avoiding relativity, but rather studying it seriously and deriving better applications.

### **What the Big Bang Theorists Don't Tell You**

As I began to study cosmology, I carried into it the usual *island universe* misconception of the big bang theory which most people have, including most scientists and even many astronomers. Like most people, I pictured the big bang as beginning with tiny "cosmic egg," or small ball of hot matter exploding outward into an empty three-dimensional space. After billions of years the matter would cluster into *galaxies*, groups of hundreds of billions of stars like our own Milky Way galaxy. The resulting hundreds of billions of galaxies would themselves be clustered into an "island" of galaxies in a "sea" of otherwise empty space.

But in 1991, Roy Holt, a fellow creationist physicist, made me realize that my picture of the big bang theory was wrong. Roy, having the same preconception as I did, pointed out an inconsistency. In the alleged big bang's beginning, he said, the intense gravity from all that concentrated matter would cause it to be deep in a *black hole*, out of which the matter should not be able to emerge. Back-of-envelope calculations supported his point. If our understanding of the implications of the big bang were right, it could never happen!

I knew from my studies that the big bang theory did not claim to start out in a black hole, but at first I didn't understand why not. Then I realized that the *actual* theory, as understood by experts, does not depict an "island" universe. That is, it has no large volume of empty space unoccupied by galaxies. By making an arbitrary and unjustified assumption, the experts would have space be roughly uniformly populated with galaxies.

In the big bang's mathematical model of the beginning, *space itself* would expand outward with the ball of hot matter, and the matter would completely fill space at all times. There would never be a large empty part. In the most favored version of the big bang, if you traveled very fast in any given direction, you would arrive back at your starting point without ever encountering a large region of empty space. That makes it impossible to define a boundary around the matter, so the matter could have no center of mass. With no unique center for gravity to point to, there would be no black hole at the beginning.

Knowing their theory is very difficult to visualize, big bang experts don't try hard to correct the public's "island universe" misconception. But occasionally they do make brief comments, such as,

*This [picture of the big bang] is wrong . . . there is no center and edge.*<sup>5</sup>

### **But What If There Is a Center?**

In contrast to the big bang story, the Scriptural record appears to imply that the universe is in fact, an island universe. Appendix B of *Starlight and Time* shows

Biblical evidence that (a) the cosmos has a unique center and a boundary for its matter, beyond which there is at least some empty space; and (b) on a cosmic scale of distances, the earth is near the center.

A finite cosmos with a center of gravity is quite different from the non-bounded universe the big bang depicts. In the big bang theory, if you could travel from our galaxy to a neighboring one, you would go gravitationally “up” for the first half of the journey and then gravitationally “down” for the next half. Going further outward would continue the ups and downs, but they would average out to about zero. On a large scale, such a universe would have no part which would be significantly higher (gravitationally) than any other part.

But in a creationist cosmos having a center of gravity, if you were to travel outward from the center you would, on the average, go steadily “upward” in a gravitational sense. On a large scale, the heavens would be at a higher gravitational “altitude” than the earth. As Isaiah 55:9 says: “*For as the heavens are higher than the earth . . .*”

A center of gravity is important because an effect in general relativity called *gravitational time dilation* comes into play. Experiment and Einstein’s theory agree that time and all physical processes run more slowly in areas which are lower in a gravitational field than in areas which are higher.

The effect is very small normally, but it turns out that when the expanding universe was at a critical size (about fifty times smaller than it is now), gravitational time dilation would have been very important. My theory proposes that the cosmos was at that critical size during the fourth day of Creation Week. While one ordinary day was elapsing on earth, billions of years worth of physical processes were taking place in distant parts of the universe. This allows starlight from even the most distant star to arrive during or soon after the fourth day, the same day God created all the stars. During that day, most of the expansion of the cosmos would have taken place.

The bottom line is that relativity forces us to say *by whose clocks* we specify the age of the cosmos or the timing of events within that cosmos. My book points out that the Bible gives us time in terms of the “earth’s frame of reference, not some other frame.” Scripture says, and my theory agrees, that the universe is young *as measured by clocks on earth*.

### “Starlight Wars”

*Starlight and Time* appeared in print in October 1994. Just a few months after that, a small group of opponents of the traditional historical view of Genesis—that it means what it says—declared “holy war” on my book. Their leader was Hugh Norman Ross, whose organization “Reasons to Believe” markets a theology heavily based on big bang thinking. Dr. Ross had assumed that general relativity can lead to only one cosmology, the big bang theory and its billions of years. But my book offers an alternative—a relativistic cosmology that fits into the Biblical timescale.

*Starlight and Time* did not mention Ross, but he correctly saw it as a threat to his organization. At his instigation, the Rossites launched attacks in lay publications<sup>7</sup> and in a creationist newsletter in which I published answers.<sup>8</sup> In 1996 they tried an extensive letter campaign to Christian leaders. In 1997 they switched to a creationist

scientific journal.<sup>9</sup> Thankfully, my answers have satisfied reviewers and silenced critics. The resulting four-years debate have now been archived on the Internet.<sup>10</sup> The debate apparently ended last year after I emphasized that the Rossites had refused to comment on several key concepts and quotes from the secular astrophysics literature which support my cosmology. Their silence betrays the weakness of their arguments.

### How to Regard Creationist Models

In contrast to the way some scientists promote their theories, I don't expect people to take mine as gospel. For example, many people may prefer the mature creation of starlight, a venerable creationist theory I commented on in appendix A of my book. Even if you like my theory, please try to keep open to the possibility that a better one may come along. I myself remain open, and anticipate my tenure at ICR, with increased attention and time focused on this vital question, to bear much fruit.

Cosmic phenomena are so complex and beyond our ken that it would be especially arrogant to assume God couldn't do what He said He did simply because we can't *imagine* how. Our imaginations are very limited, but God's is not. Even in cosmology, all things are possible with God (Matthew 19:26). Every human theory needs to conform to the knowledge the word of God gives us. Regardless of the complexities of cosmology, we can *know* that the world is young because of clear Scripture in clear context, such as Exodus 20:11, "*For in six days the LORD made heaven and earth . . .*" Our privilege, our mandate, is to try to discern His methods and thoughts, and to give Him all praise and glory throughout.

### References

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