

BIG BANG

By Raymond White

I recall the first time I heard the words Big Bang. I believe I was in my high school physics class in 1962. So the idea that our universe began at a single place in a single moment of time has been around for a good long while.

Where did the idea come from? On what evidence does the science of cosmology base this idea on? The whole notion is founded on the “red shift” observation discovered principally by Irwin Hubble in the 1920s.

What is the red shift?

Light, of course, has color. And what the colors are is differing wave lengths, so that colors on the red end of the spectrum have a longer wave length than colors on the blue end, and infrared has even longer wave lengths than visible light, and ultraviolet has even shorter wave lengths than visible light.

But what wave lengths actually exist in physical nature? Well, all wavelengths exist, but some wave lengths are more common; particularly, light shot off from atoms. Each element produces light at a predictable and known wave length. And that is, in fact, how we know which stars are heavy with what elements; by its color, or colors. Sodium is a particularly interesting element because it throws off two colors that are very close and on the spectrum is seen as two bands right next to each other and is conspicuous.

The point is that when you lay out all the colors on a linear chart, the shape of that band with its ups and downs like a mountain range, clearly shows which colors are coming from which sources, and therefore which elements are at those sources producing those colors.

But here’s the thing: If the Doppler Effect were in play — that is, if all the colors from a source were redder or bluer than they ought to be — cosmologists would know it immediately because the shape of entire spectrum, that “mountain range,” is so rigid. In other words, the shape of the spectrum never changes, but the *position* of that spectrum from actual sources does change. That is, it shifts, either to the right or to the left.

What Hubble discovered is that all far objects are red shifted; and more to the point, the further objects are (objects outside our galaxy), the more red shifted they are.

So, how can that be? The implication is that far objects, in fact *all* far objects, are moving away from us, and the further objects are away from us, the faster they are moving away from us.

So, what does *that* mean? It can only mean that the universe is expanding like blowing up a balloon.

And what does *that* mean? It must mean, or so it is thought, that if the universe is expanding, then it must have been at sometime in the past, all been together at one place. Hence, the Big Bang.

Now, maybe all that’s true.

But — maybe not.

The question that serious astronomers seem to not be interested in asking is: Are there other explanations for the red shift that could be just as viable as the expanding universe explanation? I want to explore just one possibility which I call the Curved Path explanation.

Light, as it travels through space, is influenced by gravity. This was proved by Einstein. So, as light moves along, it is tugged at by objects — more by close objects and less by far objects. So that the path it travels is not a straight line but a very wiggly line. Further, when its

line bends, ever so slightly, its wave length stretches, ever so slightly. The result is that the longer its trip, the more red shifted it becomes. And it has nothing to do with the Doppler Effect and everything to do with distance traveled. So that the red shift is not an evidence of a receding universe but merely a measure of distance the light has traveled.

If this is true — or one of the other alternate explanations, and there are others — then the whole notion of Big Bang might be just a flight of fantasy and steady state really is what the universe is about after all.

There is another reason why the Curved Path explanation might be correct — (I'm not saying that it *is* correct, I'm just saying, maybe) — and that is: Dark Energy.

It was discovered at JPL that, not only are far objects flying away from us, but they are flying away from us *faster*; that is, they are accelerating. And the further they are, the faster they are accelerating.

Well, how can *that* be? Because, according to Newton's Laws of Motion, things cannot change their velocity or their path without something pushing on them to either speed them up or slow them down or change their path. Therefore, it's as if space itself is a massive pressure pushing everything outward as acceleration velocities. Everything is being pushed outward by something but we just don't know what that something is. Hence: Dark Energy.

But what would happen to the Dark Energy observations if it were once accepted that the universe is not expanding at all? Dark Energy observations might just become pointless.

Again, I'm not saying I'm right and there was no Big Bang, I'm just saying that maybe the jury is still out.