

God and the Big Bang

We have learned more about the universe in the past 25 years than we knew for 2000 years. In 1965, 2 astronomers at Princeton were scanning the skies with “radio telescope”. This device detected radio signals from distant galaxies. They noticed that wherever this was pointed in the sky there was a buzzing detected. By 2002 it was determined that this buzzing was microwaves that have existed in the universe since its beginning. This was depicted by Einstein, but it was only in the past 25 years that it was understood.

In 2001 NASA launched the Wilkinson Microwave Anisotropy Probe satellite. Its sole purpose was to detect and measure the microwave activity of the universe. The probe would detect energy or microwave activity in the universe. It could differentiate different levels of energy and could distinguish older microwaves from younger ones. It could thus determine its age. It could do this by means of the “Red Shift” of energy and light. As the bandwidth of energy widens it becomes more read, and this will help determine its age.

This survey was able to provide not only the age but also the size of the universe. We learned from it that the first microwaves were between 13 and 15 billion years old. Nothing before that time was detected. This is also the size of the universe, approximately 93 billion light years in diameter I believe. It was able to determine where the limits were for where it could detect no energy, it presumed there was nothing. To the surprise of many, it determined that universe is flat. It also is expanding now at a rate faster than the speed of light. Because it is doing this faster than light can’t move, I believe that we cannot see the limits of the universe.

The Probe was also able to determine what kinds of matter and energy there were in the universe. It determined that there was “dark matter” which could not be detected by light. This matter was necessary for there to be gravity, but we have no way of knowing it. Surprisingly in the university, matter only constitutes about 5% of the universe while “dark matter” constitutes about 25% of the universe. The existence of dark matter and energy has been suspected for a long time. Einstein did not predict it but it is now clear that it is unique because it does not interact with light. The clearest sign of it is in the rotation of the galaxies in which the matter a the farthest outreaches of the rotating galaxy is moving at the same velocity as that near the center. This suggests that there is a matter which enhances the gravitational force of the objects.

WMAP also was able to identify the presence of energy and “dark energy” in the universe. This energy constitutes nearly 70% of the energy in the universe. It is only through gravity that dark matter is made known to us. Both of these are mysterious because they do not react to light. Dark energy, however, seems to “react only with gravity” as the physicists declare. Research aims now at determining the atomic structure of dark matter and dark energy as it is the most common element in the universe. Dark matter is also seen as somehow involved with “black holes”, and at this point the research is far beyond me.

A consequence of Wilkinson is that this one research project generated more first-rate scientific papers than anything in history. It answered the philosophical question “Is the universe eternal”? No it is not. How big and how old is the universe? It is very, very old and very big. We can’t imagine its size. It answers the question what is out there? Mostly dark energy. Contemporary astrophysicists are aware of the great question these discoveries provoked: where did all of this energy come from? They have no answer to it. It is difficult because the universe is intelligible. We can understand it. We now know to an incredible degree how it works. It is not just a mess of incoherent elements, pieces and parts coming out of nowhere and going somewhere. It is something we can understand for there is an intelligibility to it. And because it is intelligible, we believe, and I stress “believe” that we can answer further questions.

If you please take a look at the handout it has two illustrations on it. The top one is the first attempt to depict the universe as Wilkinson discovered it. On the far left one can see the eruption of the “big bang” This was an absolutely immense emergence of energy and no one knows its source. This period was a time expansion stopped expanding for about 5 billion years while the stars and galaxies developed. The universe simply stopped growing and the universe began to widen. This is depicted in the lower illustration, which is taken from a more recent probe, the Planck probe, which was named after Max Planck who suggested the quantum theory model. Other things may have been happening then, but apparently we are unaware of them. But about 6 or 7 billion years ago, the universe started to expand again. My hunch is that in that immobile period dark matter and energy started to exist in greater quantities. And as dark matter reacts with gravity, it was able to expand dark matter and the universe began to expand. At our point in time, the expansion is enormous: it is faster than the speed of light, which we cannot see the very boundaries of the universe.

We believe that there is a great deal of dark matter in the universe. One of the problems astrophysicists encountered is explaining the velocity of the rotation of planets in a galaxy. They discovered that those entities closest to the axis of rotation move at the same speed as those farthest from the center. They explain this by asserting that dark and invisible matter occupies the space between the center and ends of the rotating spiral. Because there is matter between them their comparative speeds can be constant.

Two things open the door to the possibility that the universe was designed and created. The first is its sudden appearance. We may very well find that the origins of the universe are found in this mysterious dark matter and dark energy that could be eternal. I doubt that, however, because the dark energy and matter seem to be a product of the initial quantum fluctuation.

Thomas Aquinas taught that the world is “intelligible” which means it can be understood. That certainly seems to be the case. Because it is intelligible, I believe there are two reasons for believing it was created. The first reason is that causes and effects are proportionate. Little products are the result of little causes. And great consequences are the product of great causes. Also greater complexity requires a more complex cause. This relationship suggests a divine cause. We cannot explain the sudden appearance of all this energy. And the relations between this initial massive energy and the universe are proportionate. The inflation, pause in inflation and then the expansion of the universe seem to be engineered.

Another reason for believing that the universe was created by God is its enormous size. We now believe that the diameter of this flat universe is 93 billion light years in distance. What could possibly bring about something this size. It is precisely because the universe is so vast, but also that is intelligible and filled with such precision, harmony and cooperative actions that we can ask if there was a cause being it other than random chance that we proportionate to its power, size and complexity.

In summary belief in a created universe is not without reason given its mysterious origin, the complexity of the universe and its enormous size.

How does all of this relate to God? The question asked by the physicists raise this: Where did all of this energy come from? That is the perfectly correct question to ask. There is so much in the immense, powerful and unmeasurable universe we now know that we have to ask this question. To answer it there are a few considerations we need recall. The first consideration is that the causes of effects are usually proportionate to the effect. Igniting a small amount of gasoline creates a small fire. Doing the same with a large amount creates an immense explosion. The cause of the universe had to be proportionate to the amazingly rich, diverse, complicated, enduring and growing entity that it is. If there is anything we have learned it is that the universe is vastly larger and more complex than anything we have previously suspected. Driven by an immense pool of dark energy, it is expanding faster than the speed of light. This intriguing because it means that we will probably never be able to see beyond the bounds of the universe, if there is even anything there. And the now well-known complexity of the universe suggests that the creator is profoundly complex and has an unheard capacity to create, organize and coordinate intricate, subtle and complex issues. I think that these two factors serve to

stop us from immediately ruling out God as the creator. How all of this came to be and who or what did it are still beyond our reach.