

Abby White
Scientific American Essay:
“Hubble’s Top 10”
Astronomy MWF 9 am
December 13, 2006
Final Exam

Scientific American Essay
“Hubble’s Top 10”

Hubble telescope, which just had its 16th birthday, last April, is being threatened of no longer being in existence. Because of NASA having trouble being able to make it up to the telescope, they think that there is a huge possibility that the telescope’s life may be over in mid-year of 2008. Hubble has been a big influence to astronomers all over for the last 16 years. It has helped astronomers prove many theories, but yet it has never actually discovered anything. Instead all it has really done is made astronomers thoughts real. The way that the author tells us that the telescope has done this is by the telescope becoming deeply integrated with the material that it is researching. In other words, it is right up there with the planets and stars and the other universes, so that it can see what is truly going on up there in space. The author believes that Hubble’s achievements have been, “both providing astronomers with unprecedented detail and in bringing a glimpse of the wonders of the universe to homes worldwide.” Because of all that Hubble has done, researchers feel like they are living in a “Golden Age” during today’s time. So what Livio, the author, has done; is created a list of the top ten theories that he believes Hubble helped the most with proving to be true.

The first thing that he found important was the impact of the Comet Shoemaker-Levy 9, which collided with Jupiter. This was really special because astronomers believe that this only happens about every 1000 years. What this finding ended up showing astronomers was that

Jupiter might be made up just like the sun. This has not yet been proven, but it has put the thought into astronomers' minds, and they can now research it further.

The second thing that he thought was important was extrasolar planets. During the American Astronomical Society in 2001, astronomers were asked to tell what they felt was the biggest discovery. Most of them said that it was the discovery of planets outside of our solar system. Most of these planets have been found with land based telescopes, but astronomers are only able to figure out the size of the planets, and a little bit of information on the planet's orbit. But with Hubble they have been able to figure out so much more. The telescope was able to figure out the body weight and size of the planet that was a companion to the star HD 209458 that it is comparable to our planet Jupiter. But Livio says that the most impressive thing that Hubble did during this was make the "first measurements of the composition of a world around another star".

The third thing that Livio thought was important was how Hubble helped astronomers understand the way that a neutron star is formed. The problem that astronomers had with understanding these was that there had not been one that had been formed within our own galaxy since 1680. But in 1987, there was one that went off in one of the Milky Way's satellite galaxies. Although Hubble was not up then, it was still able to go up afterwards and track what was going on after the explosion. What it ended up finding was that after the explosion there were rings that were around the star. This one happened to have three, but there was something that was not quite right about this. After the astronomers did a lot more research, they were still unable to understand these rings.

"For a long time astronomers have known that narrow, spouting streams of gas are the signposts of stellar birth." This is the fourth theory that Hubble helped to prove to be correct. The

telescope did find evidence that say that the jets do originate at the center of the disk. Hubble also found evidence that said that these disks would be deeply embedded in their parent clouds, which means that they would be impossible to see.

The fifth theory that Hubble helped with was that our galaxy, the Milky Way, and the galaxy right next to us, the Andromeda, were created the same way. Astronomers thought that they had been formed in the same way which was that they just mocked the way that smaller solar systems were made. But what Hubble found was that the halo that is in Andromeda has a bunch of young stars, but in the Milky Way, there are not very young stars there. So, this means that the two galaxies may look alike, but they were not formed in the same way.

The sixth fact that Hubble helped with was that there is a black hole in every galaxy. After Hubble looked more into this fact, the telescope found that the formation of a galaxy and the formation of a black hole are connected.

The seventh question that Hubble has helped with was what is really happening with the Gamma-Ray burst (GRB's). What the telescope found was that while supernovas can happen anywhere, GRB's will only happen in the very bright areas. This is important because bright stars have a lot of winds, which causes them to lose some of their mass. Then the GRB's take that mass up, which then makes them heavier. After they become heavier they will then collapse. So part of their collapse is because of where they are located within the universe.

One question that astronomers have always wondered about was what the universe looked like after the big bang. This is the eighth question that Hubble has helped astronomers with. So what Hubble has done to help answer this question is look at other universes that are all different ages and then see what they all looked like. What astronomers found was that stars are

created faster than what they are today. Everything seems to have a faster rate of creation than what it is today.

The ninth discovery that Hubble is helping with is how our universe is continually expanding. What the telescope does is that it keeps measuring the universe, so that astronomers can keep track of what is going on. So it takes measurements constantly. And the tenth thing that Hubble helped astronomers with is that the universe is still expanding. What it found was that the universe started to accelerate about five billion years ago. Hubble found 16 distant supernovae's that helped to prove this to be true. So, as anyone who has read this article can see, Hubble is a very important telescope, and has helped many astronomers with figuring out their theories.

Work Cited:

Livio, Mario. "Hubble's Top 10". Scientific American July 2006: pg 43-49