

Explaining the Universe

Understanding the universe, or at least understanding that which humans have discovered, is a difficult feat to overcome, especially considering the number of complexities that comprise it.

Something that can prove to be much more challenging is trying to explain what you know to your family. I did this with my family and it proved to be an accomplishment in itself, though it was also a fun time.

I first asked my family if I could have some of their time on a Friday night to teach them something about the night sky. We went outside on March 23rd, 2012 at around 8:00 P.M. I started with pointing out different asterism's in the night sky, beginning with the most recognizable one, the Big Dipper. Because the Big Dipper was near our zenith, it was easy to spot and since everybody was able to find the Big Dipper with ease, I decided to use this as a point of reference in pointing out other stars, which ended up being a smart decision. I explained to them that the Big Dipper is naturally a point of reference in the night sky because the two stars at the end of the "dipper," Dubhe and Merak, point directly to the North Star, Polaris. We went through several other asterism's, such as Orion, Gemini, and Cassiopeia. Though the Big Dipper was a great reference point, I had to get a little creative due to just how many stars there are in the sky. Once I directed my family to a particular area of the sky, I would then have to describe the shape of an asterism or even just a part of one. They were able to find Cassiopeia after I described it as "looking like a double-u," as well as Orion after I described his belt consisting of three stars. When I attempted to point out the star Sirius, however, my family insisted that it was a plane because of its sparkle. It took a few minutes of bantering before I was finally able to convince them that it truly was the brightest star in the night sky. Identifying the planet Jupiter, however, was fairly easy, simply due its unique brightness.

Danielle Wickingson
PHYS 1040-6
03/23/2012

Aside from locating different stars and planets in the night sky, we also discussed various concepts that are very important to at least understanding the universe on a very basic level. It was not very long after we first started star-gazing did I mention the fact that we see the stars as they looked multiple millions of years ago, due to all stars being many, many light years away. This fact blew their minds and soon I was spewing out space fun-facts dealing with the physics of black holes (or lack thereof), the theories of the Big Bang, how stars live and die, and how all of the elements we know of today are created through the life and death of stars. I also managed to spook them with talk of Betelgeuse's impending Type II Supernova explosion, though I reassured them it was nothing that would happen soon and that they should be more worried about the possibility of the asteroid Apophis colliding with the earth in 2036. I found that while I was explaining these things, it was very helpful to have a metaphor handy in order to describe the complexities of the astrophysics that I have learned. For example, to bring the incredible mass of a neutron star into perspective, I explained that a single teaspoon of a neutron star would weigh multiple billions of tons. However, I had some trouble with explaining black holes because I didn't know how to emphasize just how incredible a black hole's gravitational pull is. Ultimately, when it came to explaining these types of things, I found that while I think much of this information is incredible, not all people do, and that short-and-sweet is a much better tool than lengthy explanations.

Through this experience, I learned a lot about how to explain what you know about stars to those who have never really thought much about it. The two most important tools that I discovered were easily identifiable points of reference as well as various metaphors to bring the laws of physics into perspective. Most people have a basic knowledge of space and finding out what they know can be a great tool in expanding upon the way the universe works. I had a lot of fun, as did my family, and, without a doubt, it is no lie that we all walked away from the experience having learned something new.