Dark Matter and Dark Energy

Introduction

- Chairs, tables, pencils and pens; everything that you have ever witnessed in your life along with galaxies, stars and planets constitutes a mere 5 percent of the known universe. Along with matter, there are mysterious occurrences called dark matter and dark energy. Dark matter makes up 25 percent of our universe whilst 70% of it is dark energy. This means that everything we experience and encounter on a daily basic is tiny in the grand scheme of things. On top of all of this, we really don't have much knowledge about what exactly dark matter and dark energy is mainly due to the fact that they're invisible- hence why they're called "dark". So, what do we really know about these concepts?

Dark Matter

- Dark Matter is the stuff that makes it possible for galaxies to exist. When astronomers tried to explain why the structure of the universe is the way it is, scientists started to realize that there simply isn't enough normal matter to make up the whole universe.
- The gravity of normal matter is simply not enough to form complex structures such as galaxies. The stars would probably be scattered and jumbled up everywhere without any form and so galaxies would not be able to form.
- So, we know that there is something within and around these astronomical bodies which results in the formation of galaxies and other objects.
- Besides being able to calculate the existence of dark matter, we can kind of see it. Areas with high concentrations of dark matter bend light passing near it. These observations show us that there is some sort of matter there that is interacting with gravity.
- So, to conclude about dark matter, we mainly know 3 things about it: there is something out there in the universe causing all these disturbences, it interacts with gravity and that there is a lot of it. Dark matter is probably made up of particles that we have never theorized or imagined before and interacts with light and matter in a mysterious and peculiar way. But, for now, we don't really know.

Dark Energy

- Edwin Hubble's discovery of red shift shows that the universe is expanding in all directions. However, recently, astronomers have discovered that the universe is expanding at an exponential rate and that the reason for this accelerating expansion is dark energy.
- The following are ideas of what dark energy might be:
- It could be a property of space. As the universe expands, it could be that more and more space fills the gaps which is why it looks like space is expanding at an increasing rate.
- Astronomers have come up with a cosmological concept stating that dark energy is a force that counteracted the force of gravity. makes a second prediction: "empty space" can possess its own energy. Because this energy is a property of space itself, it would not be diluted as space expands. As more space comes into existence, more of this energy-of-space would appear. As a result, this form of energy would cause the universe to expand faster and faster.Only problem is that when we tried calculating the value of that energy, the results were so disproportionate that it made the whole world more confused.
- Another theory is that empty space is full of temporary, virtual particles that spontaneously and continually form from nothing and disappear into nothing again. The energy from these particles might be dark energy.