Expansion of the Universe

Redshift

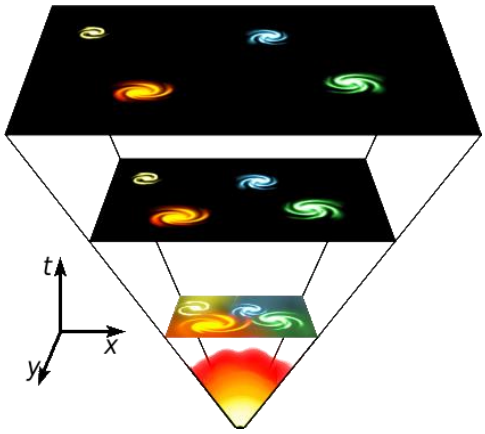
- **Redshift** occurs when a light source is moving away from the observer. This occurs because as an object moves away from you, the wavelengths of visible light are stretched. Light of lower frequencies are on the red end of the spectrum.
    - Because we can observe redshift in galaxies, scientists believe that the universe is expanding.

Expansion of the Universe

- Edwin Hubble compiled measurements of redshift and distances to galaxies. Through these measurements, he concluded there was a relationship between speed and distance between galaxies. This is called **Hubble's Law.**
- Hubble's Law states that the farther away a galaxy is, the faster it is moving away from us.
- This is one of the major reasons to why astronomers believe that the universe is expanding.

Study Tip

Think of the expansion of the universe as an inflating balloon. As a balloon is inflated, it expands in all directions. The universe also expands in all directions.



The distance between galaxies expands over time, although the size of each galaxy stays the same.

Concept Check

- Why does redshift occur? What can we determine from redshift?
- What is Hubble's Law?
- How do we know that the universe is expanding?