

# The Big Bang Theory

What evidence do we have to support the Big Bang Theory?

# Big Bang Theory

The theory that the universe began about 13.8 billion years ago when something unimaginably small and dense suddenly and rapidly expanded to immense size

# First Piece of Evidence: **Redshifted**

Spectra lines of galaxies were slightly displaced from their normal positions (Doppler effect)

Most observable distant galaxies are **redshifted** (moving away from the Milky Way)

Conclusion:

- ★ Galaxies are moving away from us and each other
- ★ Galaxies are expanding

# Second Piece of Evidence: Cosmic Microwave Background (CMB) Radiation and WMAP

Cosmic Microwave Background Radiation is radiation left over from the big bang.

Initially the universe was very hot (gamma rays). As the universe expanded, wavelengths stretched, got cooler and changed from gamma rays to visible light and then to microwaves (this is what we observe today). This radiation fills the universe.

WMAP (Wilkinson Microwave Anisotropy Probe) confirms these findings

Conclusion:

★ CMBR shows the universe is expanding