

Big Bang

13.8 billion years ago all the matter, energy and radiation in the entire universe was at one location. Suddenly, there was a huge explosion that sent everything in all directions.

Evidence for the Big Bang

- Cosmic microwave background. 2.7 Kelvin (residual warmth/heat from the Big Bang)

Hubble's Law. The Universe is expanding. Galaxies must have been closer together in the past than they are now. So now, Galaxies are accelerating away from us.

On a large scale, the universe looks the same to observers in different places at the same time.

- Isotropic = looks the same in all directions
- Homogeneous = would look the same if we were located elsewhere, say in another galaxy.

Patterns and relationships in the sky

- Constellations = brightest stars that were connected together into configurations, which ancient astronomers named after mythological beings, heroes, and animals (EX: Orion, the Dipper, the Great Bear).
- Zodiac = twelve constellations through which the sun passes as it moves along the ecliptic over the course of a year.

Celestial sphere

- Celestial sphere = the stars seemed fixed to a celestial sphere surrounding earth.
- North celestial pole = north pole projected up to the celestial sphere
- South celestial pole = south pole projected to the celestial sphere
- Ecliptic = path of the sun on the celestial sphere. Off set 23.5 degrees from the celestial equator.