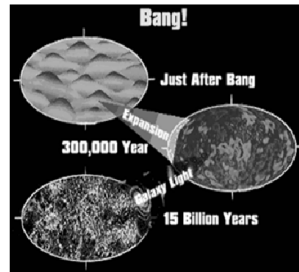


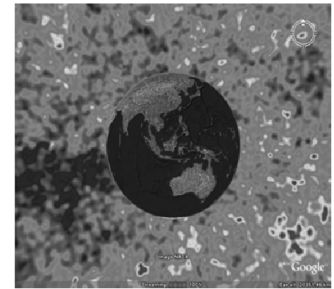
## Big Bang Theory

- At one time, the entire universe was confined to a dense, hot, super massive ball. Then, about 13.7 billion years ago, a violent explosion occurred hurling all this material in every direction.



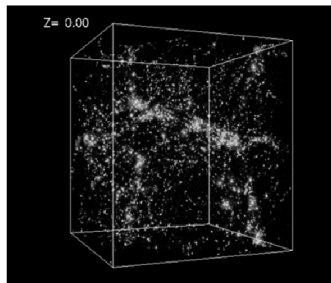
## Expansion of the Universe

- The red shift of galaxies indicates the universe is still expanding.
- Scientists discovered a form of energy known as cosmic background radiation. This energy was found radiating from an unknown source in space.



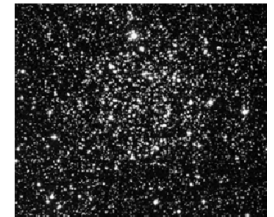
## Structure of the Universe

- Planets, stars, and gases only make up 5% of the universe. The other 95% is dark matter and dark energy.



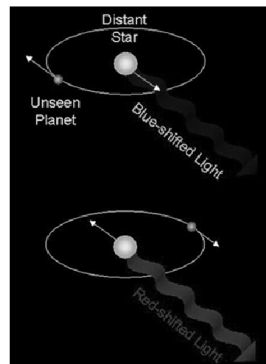
## Types of Galaxies

- There are three main types of galaxies.
  - Spiral** (like the milky way)- a bulge in the center that spirals outwards.
  - Elliptical**- contain older stars and very little gas.
  - Irregular**- undefined shape and lots of young stars, gas, and dust.



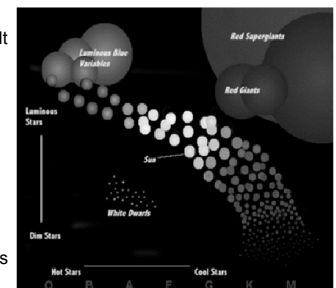
## Shift of Galaxies

- Red shift** describes the movement of galaxies away from each other. According to the Doppler effect, this causes a shift toward the negative or red end of the light spectrum.
- Blue shift** describes the shift of galaxies closer together. This relates to the Doppler Effect which states that the shift results in the movement to the positive or blue end of the light spectrum.



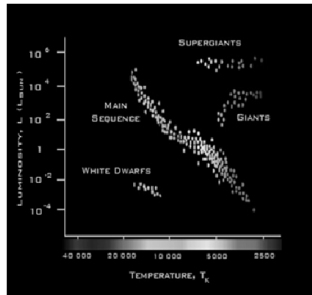
## Classification of Stars

- Prostars**- Prostars take form before the actual star is formed. It is made up of large masses of dust collapsing forming a molecular cloud.
- Main Sequence Stars**- Main Sequence Stars make up the majority of the stars in the universe. They run on burning hydrogen into helium through nuclear fission.
- Super Giant Stars**- Super Giants stars are the biggest stars in the universe. These stars are fueled by consuming hydrogen.



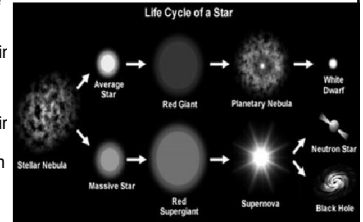
## Stars Continued

- **Red Giant Stars**- Red Giant Stars take form after a main sequence stars loses the hydrogen that fuels it causing it to expand. These stars are fueled on the remaining hydrogen an helium in its core.
- **Neutron Stars**- Neutron Stars are the result of a star dying and forming a super nova. Neutron stars are composed solely of neutrons.
- **White Dwarf Stars**- When a star loses all of its hydrogen to fuel itself the outward light pressure causes it to collapse into itself forming a white dwarf stars.



## Stellar Evolution

- The life of a star begins as a Protostar which is formed by large clouds of dust collapsing.
- Further cloud collapsing results in the formation of a Main Stream Star.
- As the stars age and use up their helium they expand. The star eventually reaches it's maximum area and is called a Red Giant.
- After this stage the star either becomes a Planetary Nebula, a White Dwarf, a Neutron Star, or a Super Nova.



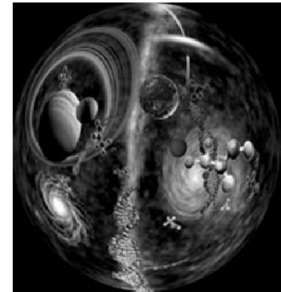
## Probing the Universe

- The Technology used in probing the universe include a high energy telescope known as The High Energy Focusing Telescope.
- This telescope uses high energy x-ray focusing modules used to examine highly energetic objects in space.



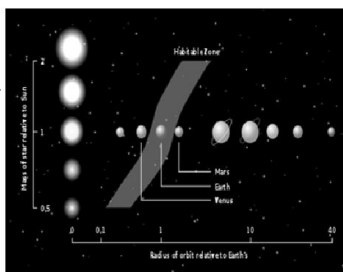
## Requirements for Life

- The Galactic requirements for life include energy in the form of either sunlight or chemical energy which may be provided by respiration or fermentation.
- Biological aspects such as Oxygen, Nitrogen, Carbon, and Phosphorus are also vital for life
- Protection from UV radiation in the form of solid shelter or an ozone layer is also a crucial requirement for life.



## The Habitable Zone

- The Habitable Zone is a term used to describe an area in a certain galaxy that is able to support life
- Planets or other orbiting objects in the habitable zone must be close enough to a sun or other large planet to provide sufficient heat.



## Andromedae: the star with a solar system

- In 1996 astronomers Geoffrey W. Marcy and R. Paul Butler discovered a massive planet orbiting the star Andromedae.
- Although these planets are not visible to the naked eye, a slight wobble caused by the planet's gravitational pull allow astronomers to calculate the size of the planet.
- Two other massive planets and many smaller ones around Andromedae have been discovered due to this information.

