

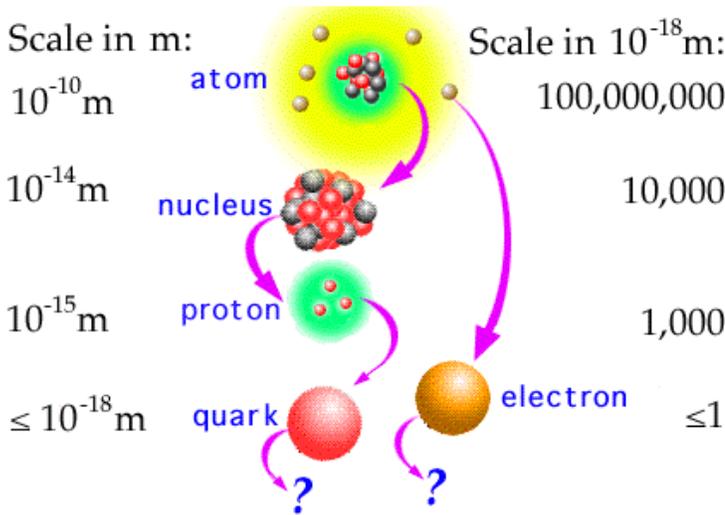
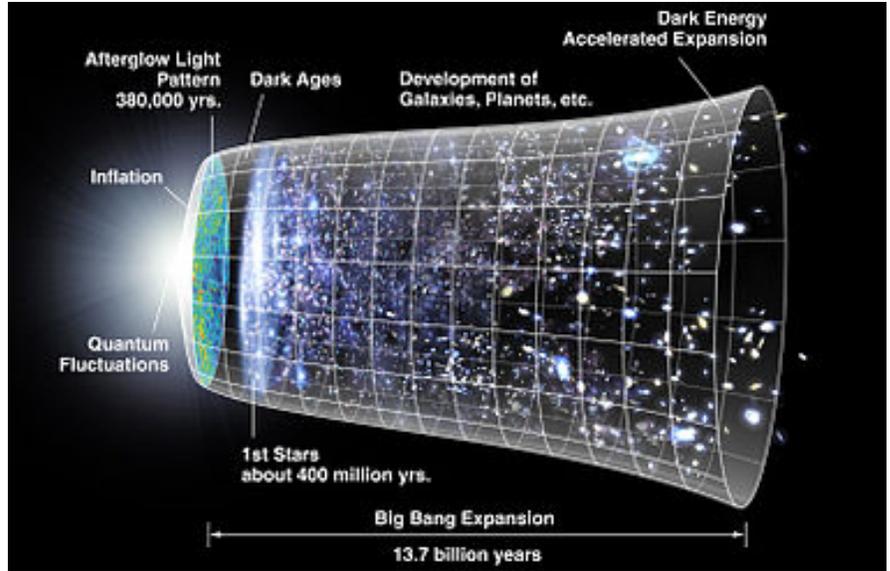
Refer to Origin of Universe p 836-839;
Origin of Solar System p.221

“We are all stardust”

_____ is the moment when all matter and energy were formed in a cosmic explosion

Occurred: _____

generated _____ that went flying out into space along with energy

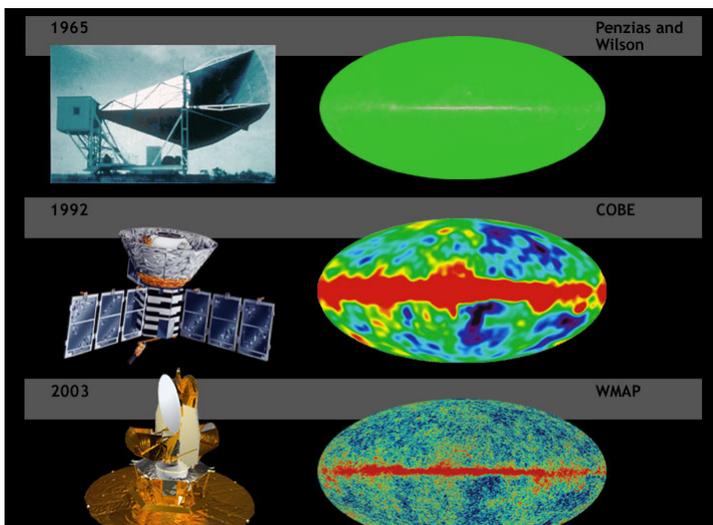


Quarks _____ (came together) to form _____, _____, _____ subatomic particles

_____ are used to study quarks and what happened in the Big Bang.



Bombard subatomic particles w/ other subatomic particles and look @ what gets ejected as they collide



Even today when we listen in space we hear a hiss indicating the presence of _____ still radiating since the Big Bang.

Inflation

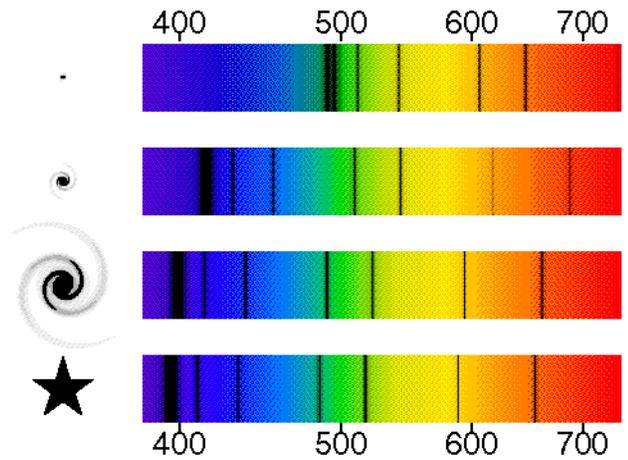
- A process that started when the universe formed and continues today.

[Expansion video](#)

We can see evidence of this in _____.

As an object moves away from the observer there is an _____ in the wavelength of any light emitted. [the Doppler Effect](#)

As an object moves towards the observer there is an decrease in the wavelength of any light emitted.

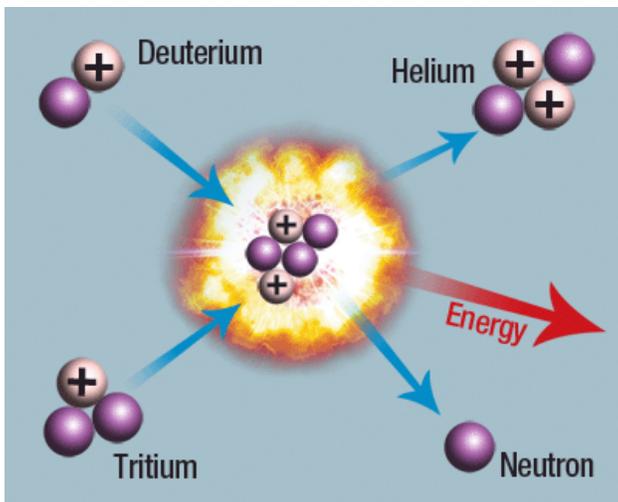


Gravity!

The Big Bang made quarks which coalesced to form atoms of _____ and _____.
How do we know this? What is our evidence?

Those atoms clumped together and the clumps grow as a result of _____.

- The largest clumps get hot and dense enough to start a fusion reaction.
- _____ reaction: two smaller atoms combine to make a larger atom.



A Star is Born!

Stars are powered by _____.

- [Origin of our solar system.](#)

These fusion reactions start out making _____

- like He and Li.

When all the _____ in a star is used up, large stars will collapse in on themselves (implode).

_____ = An exploding star!

- When all the hydrogen is gone and the star is imploding there is enough heat and pressure for _____ elements (up to iron) to form.
- When the star runs out of any smaller elements to fuse it explodes out and all the rest of the elements after iron are formed.

REPEAT Gravity!

- Gravity pulls atoms back together forming _____ and sometimes planets like ours.
- These new objects have a mix of all sorts of elements.

Evidence for the Big Bang

1. Background hiss of _____
2. Hydrogen is the simplest and most _____ element in the universe followed by He
3. _____: the universe is expanding
4. Stars and supernovae repeat patterns

