



Thursday, January 24, 2019

Pick up: none

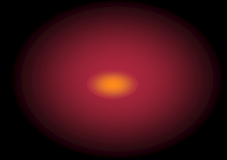
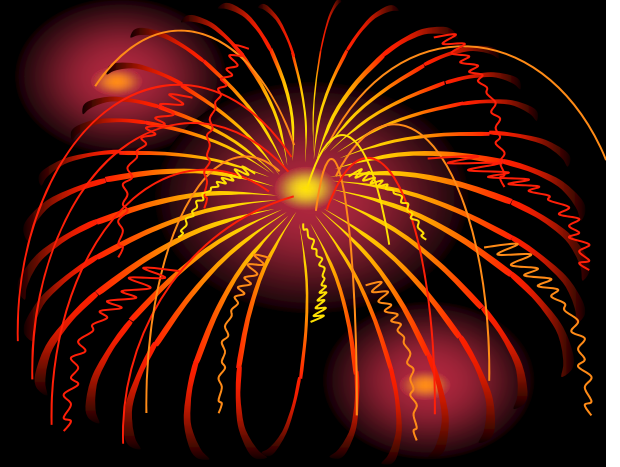
Today you will:

- Complete Day 2 of Bellringers
- Finish Cornell Notes on ISN pg 111
- Write some notes on your own on the Universe → Galaxies → Solar System ISN pg 113

HOMEWORK:

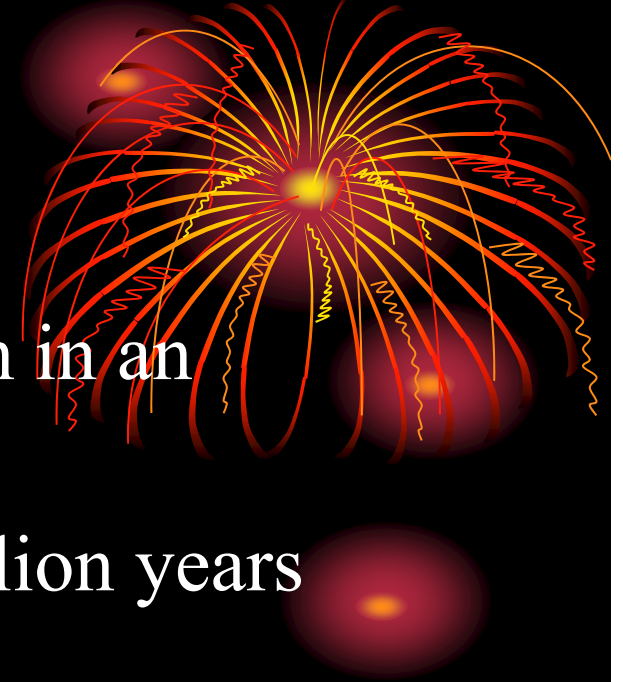
- Anything in ISN not complete
- Quiz-Friday, Feb 1, DIA-Thursday, Feb 7

Origins of the Universe



Big Bang Theory

- Theory that the Universe began in an instant, enormous explosion
- Occurred an estimated 13.7 billion years ago
- Low levels of energy called Cosmic background radiation was discovered by radio telescopes (believed to be remnants of the “Big Bang”)



In Our Universe there are...



- Planets (we have 8 in our solar system)
- Stars – like our sun (there are approx 200 billion other stars in our galaxy alone!)
- Solar Systems – includes a star and orbiting planets (500 other solar systems in our galaxy!)

- Galaxies (like our Milky Way) group of stars, star systems (with planets), star clusters, dust & gas

- Can be *spiral, elliptical, or irregular*.

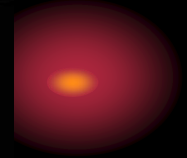
- (approx 10,000 other galaxies visible from Earth!). Scientist believe there are many more...

- Most galaxies are very large

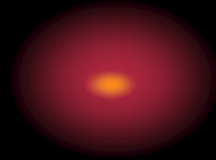
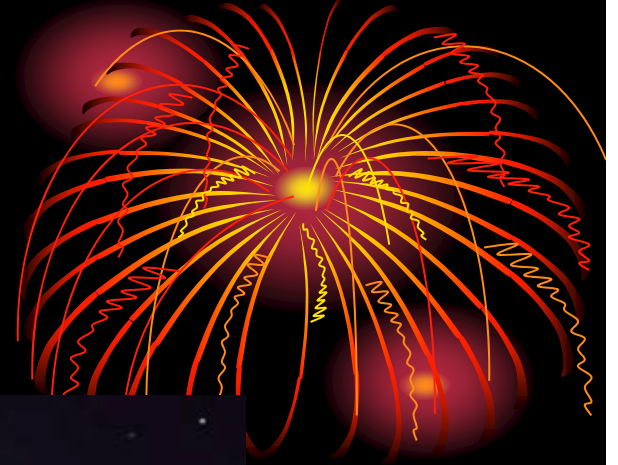
- Our Milky Way galaxy is 110,000 light years across.



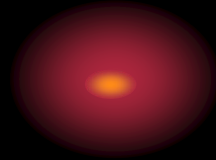
Spiral



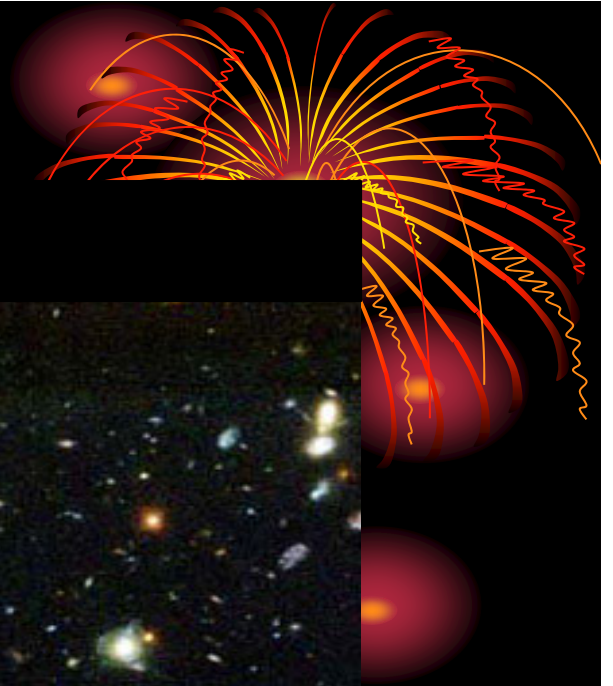
Elliptical



Irregular



Galaxies as seen from Hubble



The Expanding Universe

- Light from a single star or an entire galaxy can be used to create a “spectrum” for that galaxy.
- the colors can be used to determine if galaxies are moving



- Objects moving towards Earth = have **bluer** wavelengths on the spectrum
- Objects moving away = have longer **red** wavelengths



RED SHIFT

- At this time, all objects we observed in the universe are *red-shifted* (moving away)
- This proves that the universe is expanding



Hubble's Law

- tells us that more-distant galaxies are shifting away faster
- most distant galaxies are moving at 90% the speed of light!



“The Big Crunch”

- Scientists believe that at some point in time, it will stop expanding and collapse into itself
- It will pull everything with it until it eventually turns into the biggest black hole ever.





Stop, Think, and Review!



On your left side, answer:

- 1) How do scientists analyze whether galaxies are in motion?
- 2) What is the apparent motion of objects in space?
- 3) How does the distance from Earth affect the rate of expansion?