

I. GALAXY NOTES

NAME _____ HR _____

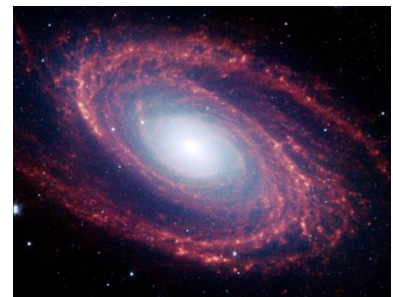
- A. _____ - large group of _____, _____, and _____ held together by gravity
1. Estimate: _____ billion in the universe
 2. all galaxies are _____ on an axis
 3. galaxies are moving _____ from each other, thus experience the _____ effect (objects moving away from the observer appear more red)
 - a) large Doppler shift = _____ speed movement
 - b) _____ Doppler shift = lower speed
 4. Hubble's law =
 - a) the _____ away the galaxy, the _____ it is moving away from us (think of balloon with dots)
 - b) red shift proves the universe is _____

B. Types of galaxies

1. _____ - large three dimensional galaxies that look like eggs or basketballs
 - a) _____ common type
 - b) _____ galaxies
 - c) Contain many _____ stars
 - d) all galaxies eventually become _____. The gravity in the center _____ it all in
 - e) some have over a _____ stars, some are so big it encompasses our entire _____



2. **pinwheel** _____ - arms extending outwards from a central _____
 - a) _____ aged
 - b) will _____ become an elliptical



3. _____ **spiral** – has only 2
 _____ extending from a central bar

a) middle _____

b) will eventually become an



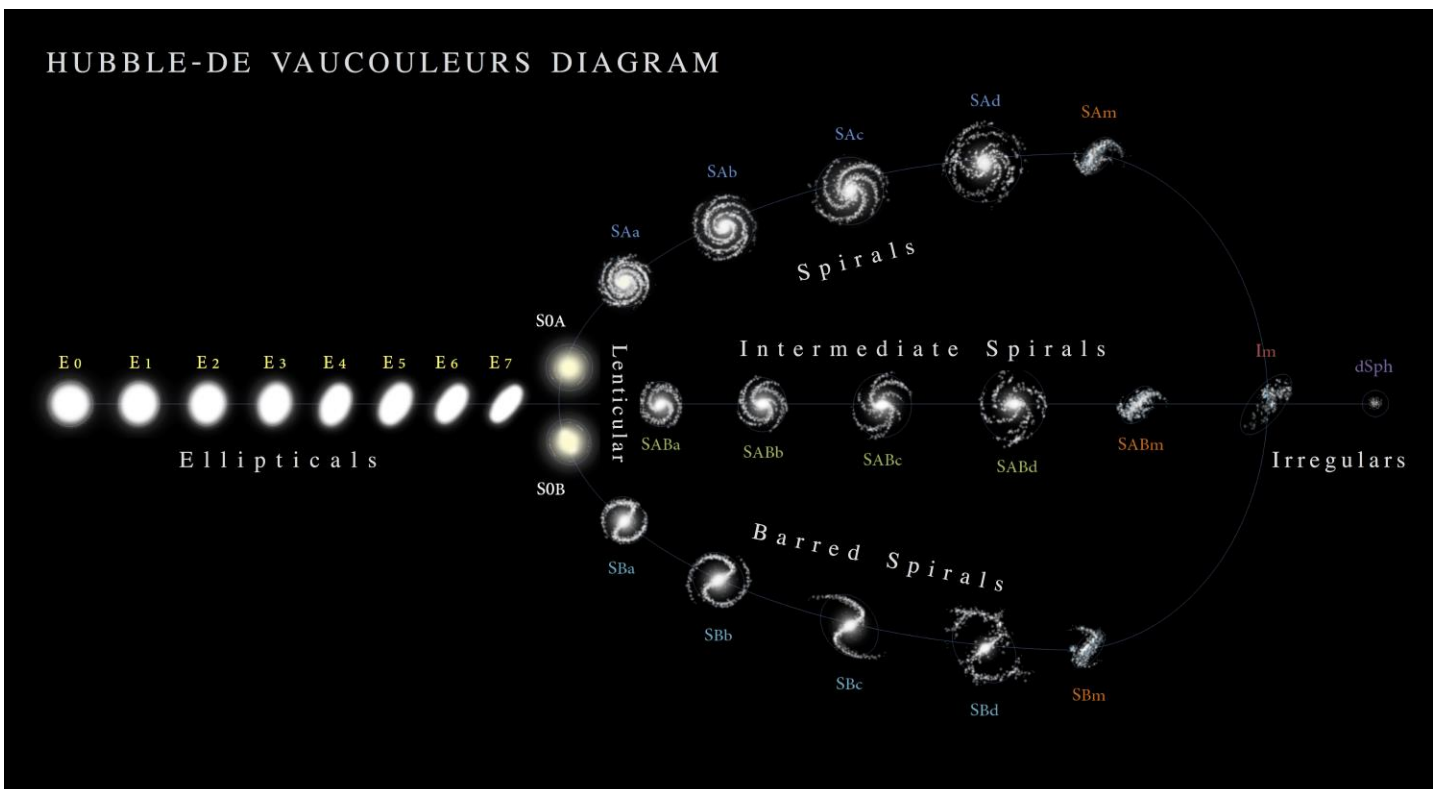
4. _____ - odd shaped galaxies that
 follow no _____

a) _____ common

b) _____

c) Contain many _____ stars

d) _____ in the middle hasn't had
 enough _____ to pull it into an
 elliptical shape yet



C. Milky way

1. The story: Zeus fell in love with a mortal human woman and got her pregnant. Her wife thought Hera (Zeus' wife) would kill her and her family so she abandoned Hercules in a field. Another Goddess who sees this invites Hera to walk through the field. Hera brings Hercules to her breast and he hurts her. She throws him across the sky spilling a streak of milk.

2. It is a _____ galaxy

3. Contains _____ billion + stars [even on the darkest nights we can only see about 3000 stars in the _____ hemisphere and _____ in the southern for a total of 6000]

4. 100,000 light years _____ and _____ light years thick

5. sun is 30,000 light years from the _____, and located on _____ arm

a) sun _____ the center of the milky way one time every _____ years

D. _____ group- 28 _____ that are relatively close together (our galaxy _____)

E. _____ - several local groups near each other added together (our galaxy city)

F. _____ - superclusters joined to form " _____ " structures.

G. _____ - all filaments added together

H. **Big** _____ - the name given to the start of the _____

1. the entire universe was a dense, hot, _____ ball.

2. _____ billion years ago a violent explosion occurred

3. All matter and energy launched _____

4. Evidence:

1] cosmic _____ background radiation and

2] all galaxies are _____-shifting

I. **The big** _____ - idea that gravity will pull everything back together

1. Not likely because universe density is below the _____ density

2. Universe expansion is _____ up, (possibly due to dark matter??)